A VIKING OF THE SKY

HUGH McALISTER

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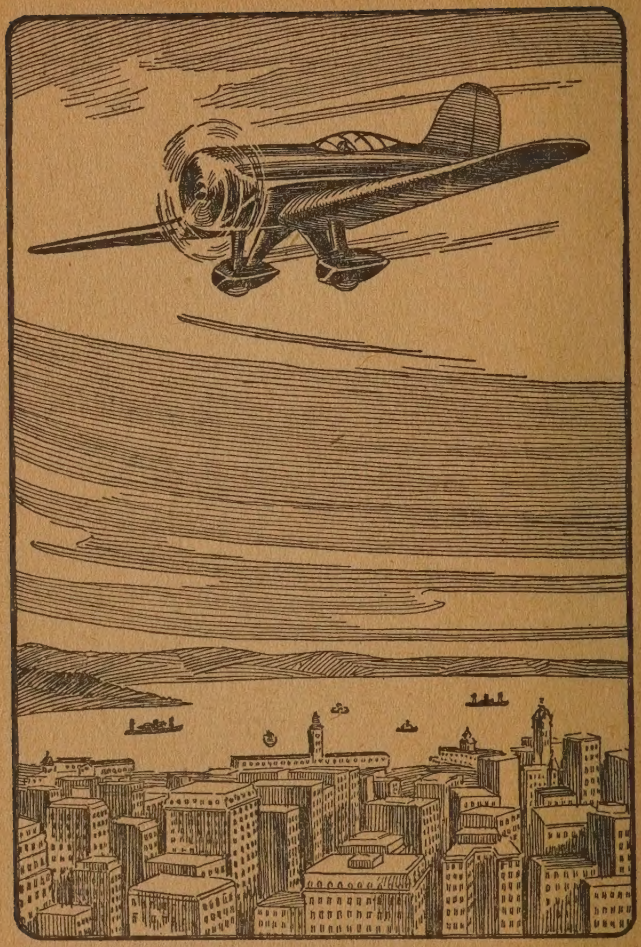

At last the heavily-loaded Wind Bird began to lift gallantly, then zoomed up into the sky.

A VIKING OF THE SKY

A Story of a Boy Who Gained Success in Aeronautics

by

HUGH MCALISTER

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"STAND BY", "THE FLIGHT OF THE SILVER SHIP",
"STEVE HOLWORTH OF THE OLDHAM WORKS",
"CONQUEROR OF THE HIGHROAD",
"FLAMING RIVER".

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A Viking of the Sky

CHAPTER I

NIGHT HAWK

"Oh, how I wish I was up there!" muttered Hal Dane to himself as he cocked an eye upward into the far heights of the moonlit sky.

In mind, Hal Dane was already just below the stars, riding the clouds in a winged ship; before him, on imaginary instrument board, ticked the latest thing in indicator, controller, tachometer. And all the while, like the other half of a dual personality, his hands and feet mechanically guided his rattletrap old truck along the ruts of the lonesome country road. On the downgrades Hal's left hand with skill of long practice chocked a brakeless wheel with a wooden block, and on the upgrades his right foot judiciously kicked a wire that let on extra "juice" for the pull.

In Hillton, Hal's home village, folks laughed considerably over the Western Flyer, which a green daub of paint on the sideboards flaunted to the world as the ancient truck's title. But

folks didn't laugh at the boy who persistently patched up the rattletrap and drove it. Anyone knew that it took genius of sorts even to hold the contraption to the straight road.

For all its decrepitude, Hal had to hang on to the old truck. It furnished his living—and a living for his mother and his great-uncle Telemachus, who was "stove-up with rheumatism." The weeks when hauling was brisk, the truck even earned a few strange luxuries such as queer Hal Dane would want—bottles of odd-smelling glue, old wire springs and bits of metal from Kerrigan's junk pile, and now and then a precious book full of diagrams of aeronautical engines.

Usually Hal got a chance to make at least one trip a day, hauling garden truck over the thirty-mile route from Hillton to Interborough, the nearest city. On the return trip he'd bring supplies for the little stores in his home village and other villages beyond Hillton.

Sometimes he had the luck to land a second sixty-mile round of hauling in one day—like the present occasion that was bringing him rattling homeward in the night.

Night hauling was wearisome work, and if it hadn't been for Hal's lively imagination he would have been tempted to doze on his job. But Hal Dane's air-minded brain was seething

with spirals and Immelmanns and three-point landings. One of the great events of his life, the State Air Meet at Interborough, had been over for a week, but every flight and entry was still fresh in the boy's mind. He lived them over again. By twist of the imagination old man Herman's two milk cans rhythmically banging against Grocer Kane's crate of lard buckets seemed almost the roar of a stunt plane warming up for action. Hal could almost think himself into seeing in that empty stretch of sky above the host of planes that had formed the "flying circus" of last week. There had been Rex Raynor, famous pilot who stunted upside-down; there had been aerial rope-swingers and ladder-climbers. There had been—

"Bang—bong—scre-e-eak!"

With a snort of dismay at the clattering outspilling of his load and the scrape of his truck as it careened sideways, Hal chocked his wheel and leaped for the ground.

"Jumping catfish!" moaned the lanky, long-legged blond young trucker as he raced madly down the road he had just rattled up. "Ought to have looked back once in a while 'stead of always up at the sky—wouldn't have happened then!" And onward he sped, chasing a runaway wheel.

This, though, was no unheard-of performance. The Western Flyer flung some piece of its anatomy to the winds on at least every other trip.

With a grunt of satisfaction young Dane fell upon his miscreant wheel as it thumped to a standstill in a ditch. Methodically he trundled it back along the road, jacked up the ancient truck on the side where its protruding axle had ploughed the ground for some forty yards, and set to work repairing damages.

An hour later the boy had his wheel cotter-pinned and hub-capped back into place. As he slid under the steering gear, he determined to keep his eyes and his mind out of the sky, and to concentrate all energies on navigating the Western Flyer safe into her garage by dawning.

But farther along the road his imagination began playing him false again. Rhythmic thump of his load of cans seemed to simulate whir and zoom of an air engine.

Imagination! Was it imagination?

All in a quiver of excitement, Hal Dane silenced his own engine and cocked a listening ear towards the skies.

There it was again—faint hum of a motor high in the air. An airplane was winging its way across the forest-covered hills that lay

between Interborough and the railroad gap at Morris Crossing. No air mail route lay that way. This must be something out of ordinary; an important message to be dropped at the railroad crossing, perhaps.

"Gosh!" ejaculated Hal to himself. "Speaking of dreaming things till you really see 'em! Listen at her coming in!"

The plane was swooping nearer; was now practically above him. Staring upward, Hal caught a glimpse of the spotlight focused on the hills below. It was turning from side to side. The boy looked on with anguish beginning to clutch at his heart. The motor of the plane was missing in an alarming manner. It sputtered and coughed—ran smoothly for a few seconds, then sputtered again.

"Trouble!" muttered Hal. "In trouble and looking for a place to land. There's no place —unless—"

Above him the plane slid crazily on its way. Now it seemed to hang in the air at a mere crawl, now it shot onward. At a spot which Hal judged was a couple of miles distant, the light became stationary for an instant, then tipped sharply downward and was swallowed up by the pine forests on the hills.

"A crash!" whispered Hal Dane. He shut his eyes, then opened them quickly, staring

hard at the moonlit landscape to impress location on his memory. That jagged pine, that spur of the hill—it was somewhere between these that the plane had crashed.

Next moment the boy was on the ground and cranking up his old truck like one possessed. As it roared into life, he swung aboard and let her out for all she was worth. In the case of a human pinned under wreckage in horrible certainty of fire or suffocation, speed of rescue must mean the saving of life. So down the woods road shot Hal, his ancient truck gallantly riding roots and ruts and snorting to the charge with a backfire like gattling guns. A tire blew out and nearly careened Hal, truck and all into a bank. But the boy held to the wheel, wrenched her nose straight to the road and bumped onward. A second tire burst, and the bumping went on more evenly.

Then the headlights showed an opening through the trees where great white wings lay flattened to the earth.

"He made it down—in the only landing place for miles!" jubilated Hal as he leaped from the truck and raced toward the grounded plane.

As he reached the scene of the crash he saw that the plane really had made a marvelous

landing, merely slightly down-tipped as to nose, and frame intact save where a sapling stub had torn a jagged hole through one wing.

Minor injuries to the plane—but the man! The aviator hung limp against the supporting belt. As the boy loosed buckles and lifted the pilot out, he felt blood dampen his hands.

Hal raced to a stream he remembered crossing. With his hat full of water, he was back and kneeling beside the aviator, splashing water in his face.

It was like a ghost rising from the dead when the prostrate man flicked open his eyes, then suddenly—as though some valiant pull of power within urged him—staggered to his feet, made a few steps and leaned heavily against his plane.

"Why—" Hal Dane's mouth dropped open in amazement as he stared at the figure picked out whitely in the moonlight, "it's—it's Rex Raynor, famous—"

"Yes—yes! Don't waste time gawking at me. Need help—got to get this—this packet on the train—at crossing!" He touched the bulge of the packet beneath his coat. His eyes were wild with pain, but somehow he forced his voice to be steady, even as he forced his body to stay upright. "Can you help—patch things—get me off—"

"Yes," Hal Dane answered, "yes!" At first he had thought to offer the truck, but two tires were down and the back axle had steered in a strangely crooked fashion towards the end of that wild dash over stumps and boulders. It might take hours, days, to get the truck back into running order. The plane—maybe there was a chance there!

First, though, Hal slit open the bloody sleeve of Raynor's coat and shirt. From torn strips of clothing he made bandages over a bullet wound in the lower left arm, and tightened a tourniquet above to stop further bleeding.

With iron grit Raynor held on to himself—sheer will power must have kept him from fainting a dozen times. In his harsh, steady voice he barked out his orders.

The impaling sapling was cut away below the plane wing. Then the upper length of wood was worked gently out of the jagged hole it had torn in the fabric. With quick, deft fingers Hal Dane whittled repair sticks out of pieces of pine. Wire from his tool chest slid in tight coils over wood, under wood, binding breaks together. Except for his overalls, Hal had very little clothing left. What hadn't gone for tourniquet was now masquerading as wing fabric. Tire glue had to do duty as "dope" to lacquer smooth the patched wing.

Rex Raynor, flyer, was too pain-dazed for his mind to give even passing thought to the strangeness of his finding, out here in the pine woods, a long-legged youth whose nimble fingers seemed expert at splicing framework and patching wing fabric. The trouble he was in tensed his nerves to breaking point. His one idea was, "The packet must go on—the packet must reach the safety of railroad officials at Morris Crossing."

In between directions for repair work and frantic urgings for haste, Raynor muttered broken details of the disaster that had befallen him.

Blue prints—aerial engine designs for the Nevo-Avilly contest—finished too late to submit even by air mail—rushing to get packet aboard mail car at crossing. Nobody supposed to know of his engine designs. As Raynor crossed level by forest ranger's hut, a red rocket, distress signal, had shot into the sky, signaling him to a landing. Knowing that the ranger, a former flying pal, had been disabled by illness, Raynor had answered the silent call by gliding to earth to render aid in some emergency. Instead of the ranger, a masked bandit had leaped upon the aviator, demanding the packet, even before switch could be cut or motor throttled. In the ensuing fight

Raynor had got winged in the arm by a close range bullet, but had managed to shake off his assailant, and had risen to the safety of the airways in his plane.

Knowing that one such daredevil attack would likely mean further pursuit, Raynor fought off bodily pain and strove to keep his mind fixed to one purpose—getting the packet aboard the U. S. mail train.

The flyer completed examination by electric torch of landing-gear, engine, wings, Hal's last improvised piece of patchwork that was hardening miraculously under its spread of tire glue.

"You have done well—it is good!" exulted Raynor, as with the boy's help he trundled the plane backwards to get room for the take-off. "We have twenty minutes—we will make it." He motioned Hal to climb into the front cockpit.

For a breath Hal Dane stood rigid. At last it had come—his chance to ride in a real plane! But he stood motionless. This man Raynor—fever burned like delirium in his eyes, he fairly staggered from weakness. A risky pilot to ride with! And yet the courage in that iron set of jaw, the determination that drove a pain-weakened body to serve the will! Raynor had come this far—Raynor would carry

on to the end. And Hal Dane would be in at that ending.

A thrill shot through the boy as he made his lightning-quick decision and climbed breathlessly aboard.

Raynor cranked the motor with his one good hand, kicked aside a wood chunk that had blocked the wheels, and scrambled heavily into the rear cockpit. With a roar the plane moved across the clearing, gathered speed, lifted within two hundred yards of the tree line. They were up and off, a thousand feet above earth!

Hal Dane's blood pounded, he gasped for breath. Then he relaxed into a feeling of keen delight.

Hal Dane actually flying! The boy knew instinctively that from now on flying was to be his real life. He had managed this one time to skim the clouds. Somehow he would manage it again and again.

Raynor had ascended rapidly. Two thousand feet below them the pine forests lay like flat dark carpets. Little rivers and streams were like silver threads reflecting the moonlight. In the distance a row of small, swift-moving lights must be the east-bound mail train they were racing.

Looking earthward from the heights stirred

no qualm, no dizziness in the boy. He felt at ease, in his own peculiar element. Turning his mind backward, it seemed that every event in his life had culminated in this engine-powered flight with wings.

Even as Hal's serene gaze sought the pin-points of trees and the silver dots of water on the earth below, the great plane shot higher, looped downward, aimed her nose at the stars again. After that came a sensation of falling, then a careening, tipping of wings from side to side.

Rise, fall, dip—all consumed mere space of a breath.

Hal Dane whirled around from his earth gazing, to steal a glance at the pilot behind him.

There was reason for those wing-dips. Rex Raynor hung in a fainting huddle across his strap. Almost at the glorious end of his race for time, the flyer's iron will had lost its fight against pain.

Raynor's ship was a teaching boat, outfitted with dual controls. Between Hal's knees rose a stick, mate to the control from which the pilot's hand had fallen.

Instinctively Hal Dane's hand shot out to grasp this lever. His one desire was to shove with all his power on the gear,—forward—

back—anywhere, to steady this awful tipping, skidding roll that was hurling the boat downward. But even as Hal's hand touched the knob of the stick, reason surged through his brain like a shout of "Wait, wait! Death lies that way!"

Reason was right. Hal's fingers clenched into palm to keep from seizing the gear. He must think it out, know what he must do before he ever shoved that lever a hair's breadth. With cold sweat bursting out to drench him, and his brain prickling to the terror of falling, falling,—yet Hal Dane held himself rigid, eyes closed, while in his mind's eye he made himself see again the paper diagram of a Wright motor's control board. In his own cluttered old workshop at home he had memorized every movement of manipulating ailerons, elevators, rudder. Memory must save his and another's life now.

When Hal opened his eyes again, his stiff lips were muttering, "Stick pushed forward, manipulates elevators—plane descends; pulled back, plane rises; pushed to right, operates ailerons for right wing bank; left, for left bank—"

To the boy mere moments had seemed hours of hurling earthward. He felt that the very tree tops must soon be dragging at the landing

gear, crippling the plane for its crash. He longed desperately to look, to see just what space lay between him and death.

Instead, for two dreadful seconds, he forced calm eyes to study the control board, forced his hand to hold the fat knob of the stick in a firm grip, to pull back—gently, gently.

And gently the ship lifted. Descent changed to ascent.

A sob of relief tore through the boy's throat. They were going up, up! The waving octopus arms of the tree tops could not snare them to death now.

It seemed he could never get enough of going up. He was above the clouds now. The ship answered beautifully to every touch on the controls. A slight pressure on the stick to the right operated ailerons and the right wing dropped to form a right bank that drifted the ship in a wide, lazy circle.

The response of the mechanism was wonderful. It was like a living thing that moved at a touch. Hal Dane felt lifted on wings of his own.

Then he passed beyond the bank of clouds. Two thousand feet below him on the earth crawled a tiny earthworm thing strung with lights—the mail train, the crossing!

Elation ebbed from young Dane's mind.

In the sky heights was safety. On the ground below lurked death, awaiting the slightest mischance in landing.

And yet Hal Dane must come down to a forced landing—now—immediately. He was not here to skim the clouds for exhilarating joy. He must rush a wounded man and an important packet to the train crossing.

Slowly young Dane circled earthward. And each downdrift laid a chill of terror on his heart. Now that he was coming to earth, earth looked most unnatural. Morris Crossing should be familiar ground; yet viewed in the white moonlight from over a plane edge, all things took on monstrously strange proportions. In his terror Hal began to feel that he could not distinguish a field from a forest, a road from a river. He might smash across housetops, might hurl himself, plane and all, into the moving train before he could stop. No, he could not do this thing, could not! If gasoline held out, he could drift in mid-air till morning.

In answer to his sudden tense pressure, the elevator was pulled so hard that the machine all but stalled, then fortunately cleared off and zoomed upward at intense speed.

High air—safety again!

But Hal Dane was no coward. Up in the

heights, his brain seemed to cool. The train was coming in. It was a matter of seconds. And he must meet that train with the packet.

Coolly he began to map in his mind the lay of the ground close to Morris Crossing. There was the group of small houses, the improvised box-car waiting-room, a storehouse, behind that an empty, rolling stretch of field. That was his chance. He must somehow land in that field.

A week ago, at the Air Meet in Interborough, Hal had watched innumerable airplanes cut motors and circle down. He had studied and read everything on aviation he could lay hands on—he knew exactly what he ought to do. But actually to do it! A terror chill quivered up the boy's spine.

Then he set teeth, coolly stopped the motor, pressed into a bank that began to drop the plane in great circles. Dane tried to remember everything at once—best to volplane down in spirals of a certain size—must flatten off to save a nose dive—must—

Then the black earth came up to meet Hal Dane.

CHAPTER II

WINGS

When Hal Dane came to himself, lanterns and electric torches on all sides bobbed criss-cross lights above him. A dozen hands seemed pulling and tugging to extricate him from the one-sided crash of plane wreckage.

He was laid out on the ground. A wet handkerchief mopped blood out of his eyes. He felt broken all over. Through a mist of pain he heard voices frantically calling, "Send for Doc! Get Doctor Joe!"

But something more than the pain and the voices beat in his brain—a throbbing "chug-chug-chug" that stirred him out of his apathy. The train, the eastbound that he'd raced!

"G-get me up," he croaked hoarsely. "Hold that train—mail packet—im-m-mportant—no, no, no!" He fought away hands that strove to hold him quiet. His struggles seemed to clear his brain, give him strength to rise. "Don't doctor me, doctor him," pointing to

Raynor, "he's injured, bad off! Me—I—I'm not dead yet, not by a l-long shot!" and Hal even managed a white-lipped grin.

It was pain to walk. But the urge to complete what he had undertaken drove him on. From Raynor's coat, thrown aside by Doc Joe who was probing the bullet wound, Hal extracted the thick envelope. After an eternity of putting one foot before the other foot, he got it delivered at the mail car of the long train that Mr. Tilton, the rotund little station agent, was importantly holding.

After the train pulled out, there was still one more job to attend to. "That airplane, Mr. Tilton," he begged of the fat little agent. "Don't let cows get at it—or people poke around too much. And maybe you'd better rope what's left of it to the fence. Big wind—might—come up."

The urge had spent its force. Hal Dane felt a thousand years old all at once. He sank wearily into the spidery, yellow-painted little car of Fuzzy McGinnis, his chum, whom all this excitement had summoned to the scene. Fuz understood. Fuz had been in smash-ups himself. In silent sympathy, and keeping the Yellow Spider throttled to a gentle gait, he carted Hal the half mile from Morris Gap to Hillton.

Doc Joe, in his own car, was bringing Rex Raynor also to the Danes' hospitable, ramshackle old house.

After his mother, Mary Dane, wild-eyed with fear, but holding to her calm, had gone over him for broken bones, that she didn't find, and had bound up his head better and had poured hot milk down him,—and after Uncle Telemachus had excitedly heard the story of the air crash three times—Hal crawled into bed and slept a round of the clock.

Next day Hal Dane's sturdy constitution asserted itself and yanked him out from any lazy coddling between the sheets. His scalp might still show some split skin from bucking a wire strut, and bruises the size of plates and saucers decorate him here and there, but he'd better be thanking his stars he wasn't disabled. And Hal did thank 'em! His work was needing him too. The truck that earned the family living was idling up there in the pine woods.

Need to get back to work rested heavily on Hal's shoulders, but worse than that was a worry burden that weighted down his heart.

As Hal, cap in hand and a bag of tools thrust under one arm, tiptoed down the long hall whose once beautifully plastered walls now gaped in ugly cracks, he paused before the room Rex Raynor was in. The door swung

half open in the summer breeze. Hal stepped in, stood uncertain, twisting his cap into a knot. He opened his mouth once or twice as if he were trying to speak and couldn't. Then finally he blurted out:

"Mr. Raynor, I—it's awful that I smashed your plane—I, oh—some day—I'll try—pay—"

"Huh!" snorted the recumbent Raynor, slightly raising his head and glaring with fiery eyes beneath beetling brows. "Huh, come here!" His injured left arm, grotesquely enlarged by bandages, lay on a supporting pillow. But with his right hand, he beckoned imperiously.

Hal came to the bed.

"Did you ever fly a sky bus before?" questioned Raynor.

"Not—not a real plane," answered Hal. "I've got books and—"

"Boy," said Raynor, reaching out his good hand and pulling him close, "boy, you're a wonder. You brought us down alive—in the night. More'n some trained pilots can do. Wing sense must have been born in you. And say," Raynor's brows drew up fiercely again, "get that pay idea off your chest. I owe you more than you owe me. If you hadn't been a plucky youngster to go up with me and bring down my wind bus by book learning, I'd—I'd

have crashed to a dead one. That's sure!" Raynor shut his eyes.

Hal eased out of the room. His head and his heart felt suddenly, gloriously light and tingling. He hadn't known what a burden he'd carried—until now that it had lifted. His spirit was free again.

After the crash where, in that last downward swoop, he had evidently pulled the wrong mechanism and tipped the plane to a dangerous turn, an obsession of distrust had oppressed him. He had begun to fear that he lacked air sense, was not fitted for the fulfilment of his dreams of wings and the airways.

And now with one lift of his brows, a wave of the hand, Rex Raynor had dispelled the gloom. What was it Raynor had said—"Wing sense—born in him!"

Hal flung himself through the front door and down the steps so excitedly that he near toppled over his red-headed friend Fuz McGinnis, who was rushing up the steps.

"What do you think you are—a Wright Whirlwind Motor?" Fuz fiercely rubbed a barked shin. "Here I was thinking you an invalid, and hopped by to say I'd take the Yellow Spider and tow in the truck from the pine woods for you."

"Don't believe my famous vehicle needs any

towing-in," answered Hal, "but I'll be thankful to have you haul my carcass and these tools out there, and apply some of your manly strength to helping me jack the old bus up." And linking arms with Fuz, Hal strode off toward the yellow roadster.

For Rex Raynor, his week's stay in the shabby old Dane home was a period of mixed pain and pleasure. At first his arm wound throbbed irritatingly, and added to it was the anxiety for the condition of his crashed plane. But these pleasant, kindly people among whom Fate had dropped him were an interesting compensation.

There was Mother Mary Dane. She was a little woman with blue eyes and lots of soft brown hair that was usually wound into a firm, tight knot, because there was never any time to primp it up and do it fluffily. When the fever pains let the aviator up from his bed and allowed him the run of the place, he marveled at the amount of work a slip of a woman like Mary Dane could "turn off." He seemed to find her always churning, or stooped over everlasting "taken-in" sewing, or on her knees with garden trowel in her hand. Her mouth would be a stubborn line combating the weariness of her eyes, offsetting the whiteness of her face—only folks didn't often catch her like

that. When she saw Raynor or Hal or Uncle Tel coming, she could usually produce a smile.

When the sun shone warm and bright, from a big room at the end of the hall would arise snatches of quavery whistling, thump of hammering. That would be Uncle Telemachus Harrison enjoying a "good day." Uncle Tel was Hal's great-uncle. When the sunshine eased his rheumatism, he pounded away at chair repairing and odd jobs to help along with the very limited family exchequer. Uncle Tel Harrison was a curiosity—a fiery little man with bright blue eyes and a bristling, bushy mustache.

As great a curiosity as Uncle Tel was the old house. Hal's mother was a Harrison and had inherited the ancient dwelling from her people.

The Harrison house had been two-storied. Then the roof fell in. Hal and Uncle Tel, with very little outside help, had cobbled up some sort of roof over the remaining lower story. In the bleakness of winter, the makeshift, curling shingles and the warped walls must have looked their pitifulness. But now in the summer, when the cudzu vine was in its swathing glory, the old cobbled-up house looked rather quaint and cool under its dress of vines.

Back of the tumbledown dwelling was a tumbledown barn that had once housed the high-stepping Harrison horses. Now it housed some strange contraptions beneath its sagging roof.

When Rex Raynor went out to that old stable under the voluble and excited escort of Uncle Telemachus, he was amazed at the variety and perfection of things aeronautical that he found there.

"Just look at 'em," chortled Uncle Tel, waving a gnarled hand about the barn workshop to include little models of gliders, models of planes in paper and wood, some tattered books on aviation mechanics, and a crude man-sized glider made of wood strips and cloth.

"Looks like this one's seen real usage." Raynor's eyes lighted up with interest as he laid a hand on various splicings of the wood and huge patches on the fabric.

"My sakes alive," sputtered Uncle Tel, "I'll say it's been used! That crazy boy's always rigging himself up in something like this, and having the kids from the village pull him off down that bare slope of old Hogback Hill. Sometimes he'd achieve a pretty good float before he'd drift to the plain at the hill bottom. He achieved his head bumped, too, a score of times, a shoulder wrenched, arms and legs

knocked up—but dang it, he keeps on trying the thing!" Uncle Tel's voluble complaining was belied by the prideful glint in his old blue eyes.

"And what does Mother Mary Dane think of all this gliding and head bumping?" laughed the flyer, turning to Mrs. Dane who had just come in.

She stood there, a hand resting on the glider wing. The eyes she lifted held a glow of pride, but around those eyes anxiety had etched its own lines too.

"Umph, Mary, she's got sense—if I do say it," grunted Uncle Telemachus. "She knows it ain't any more use to try to keep an air-minded boy out of the air than it is to try to keep a water-minded duck out of the water. Mary, she's shed tears over his busted head and banged-up shoulders considerable times. But shedding tears didn't keep Mary from giving her wing-sprouting offspring all ten of the linen sheets she heired off her Grandma Harrison. Real linen sheets and a silver spoon or two was all there was left to descend to Mary. Grandma Harrison would turn over in her grave if she knew just what an end her good hand-woven cloth had come to. A whole sheet ragged up on a hawthorn bush where Glider Number One went gefluey in a gulley

and spilled Hal for a row of head wallops. Another burned to a crisp when some invention of wing lacquer combustulated and liked to have fired us all out of house and home. There's four on that glider contraption, and the rest of 'em—the rest of 'em—" With a guilty look, Uncle Tel clapped a hand to mouth and went off into a hasty fit of coughing. He turned away and stamped down the length of the shop where he began to putter with some spruce sticks and a lathe.

When he rejoined the others, Raynor was saying:

"Didn't Hal drop a few hints that he was going to do some gliding for my benefit tomorrow?"

"I fear so." Mary Dane's lips quirked up in a smile, but her hand was flung out nervously. "And just look at that innocent little wind cloud lazying out there on the horizon! It could roll up into anything. I tell Hal that every time he even plans a glide, his subconscious mind stirs up a wind somewhere."

"What's he going to take off in—this?" Raynor touched the battered glider.

"Gosh, no—er-r—" Uncle Tel joined the conversation, then sputtered off distractedly, "er-r—well, you just wait and see!"

CHAPTER III

FLYING HOPE

Interborough got wind of the near-robbery, the wild sky-ride, the subsequent crash of a great plane on the outskirts of Hillton. A horde of reporters swarmed over to interview the crashees, to get pictures of them and the wreck. For the first time in his life, Hal Dane saw himself staring, with the usual garbled, wood-cut expression of newspaper pictures, from the front page of a metropolitan paper. But if the picture was poor, Harry Nevin, the young reporter for the Interborough Star, had at least wielded a kindly pencil. In spite of the crash, he gave Hal Dane credit for "unusual wing sense."

In reality as well as in the smeary newspaper picture the wrecked plane showed up as a dismal mess. To the uninitiated eye, this grotesque thing with its tail in the air and its nose in the mud had all the appearances of having flown its last flight. But when me-

chanics from Interborough, with Raynor to direct them, began to dig out the ship, it was found that the actual damage was done only to the propeller, although the fuselage and wings were covered with mud and some of the wing fabric would have to be patched and "doped."

"It's that ditch that did it," consoled Raynor, going over the various aspects of the "cracked-up" landing with Hal. "In the night that grass-covered ditch couldn't have looked much different from the rest of the field. But a ditch for a landing place can turn most any sky bus into a bronco-bucking affair. Nearly every pilot mixes in with something of the kind sooner or later. Settling in a little gully out in Texas about seven years ago gave me a wallop in the bean that I won't be forgetting any time soon," and Raynor ducked his head to show Hal a jagged white scar that persistently parted his black hair unevenly at the crown.

As soon as a new propeller could be shipped out and adjusted, one of the flyer's friends from the air mail route was coming down to pilot off both Raynor and his ship.

So the next day, in spite of a few rolling, murky wind clouds in the east, Hal determined to do some gliding on his homemade

apparatus. He wanted this chance to get a real aviator's criticism and advice on the board and cloth mechanisms with which he had to satisfy his longings for air flight.

Hal Dane might have wing sense, but he had no money with which to buy engine-powered wings. All he could do was patch up contrivances out of the crude materials that lay to hand.

Long ago Hillton had ceased to throw up its hands and fall in a faint over that "crazy Dane boy" scudding along gully edges propelled by a pair of sheets stretched on some sticks. In fact, Hillton had grown so used to Hal's experimenting that by now the village just accepted him and his stunts as a matter of course.

But with the famous Rex Raynor present and evincing interest in such things, the whole of Hillton turned out to watch this new gliding attempt of Hal's.

Instead of rolling out the battered little glider that reposed in the main workshop, Hal, with considerable help from all the small boys of Hillton, pushed back a section of the opposite wall, revealing that the barn had a second long room—the harness or storage room of the old days. From out of this, scraping and screaking along the ground on

its keel skid, was hauled a white monstrosity —a huge thing of wood and cloth, of wires and bars and levers.

Hilltonians who hadn't seen the latest of Hal's handicraft couldn't resist a laugh at the ungainly monster with long, warped-looking stretch of wing.

"Gangway, gangway!" shouted a youngster. "Here comes the Willopus-Wallopus!"

"Willopus, your foot!" snorted Uncle Telemachus. He himself might laugh a bit at Hal, but he wasn't going to stand for anybody else doing it. He silenced the mouthy boy with a glare from his fiery old eyes. "Hi, don't you know a wind bird when you see one?"

Wind bird, indeed! To the uninitiated, this cloth contraption stretched on hay-bale wire and sprucewood sticks, hauled out of its lair on its screakily protesting keel skid, looked more like some waddling antediluvian from the prehistoric past.

But Rex Raynor seemed to find nothing comical in the wind bird. Her slow progress while being dragged to the brow of Hogback Hill gave him a chance to study her every line. To an aviator used to the exquisite finish and polish of a modern factory-built sky boat, Hal's contraption offered a contrast of a rather sketchy aircraft fuselage. A little

board, an upright post, some slim sprucewood longerons,—that was the fuselage, if one could call it a fuselage! But for all its home-made roughness, there was an interesting compactness in the way the boy had braced his few wires and uprights down to a "V," converging at the board seat. The one wing was a long cloth-covered affair of wood strips and wires—streamlined after a fashion, for it was narrower at the tips than in the center, and thinner at the back edge than at the front edge. The longerons ended in rudimentary elevators and rudder, connected by wires to a pair of pedals set before the board seat that was fastened at the nose of the fuselage. A broomstick control stuck up before the seat too, and wires hitched it to the wings.

"The boy's worked out something, eh?" grunted Uncle Tel, shuffling rheumatically alongside of Raynor, who seemed bent on studying every inch of the curious, lumbering craft. "Got some technique all his own, eh?"

"Cat's back!" snorted the flyer, "but I'll say the kid's got technique!" He laid a hand on one of the hinged sections that formed the back of each wing tip. "Look at those ailerons he worked out on the wings! He's combined the idea of the German Taube and

the French Nomet in that wing lift. Where did he get it?"

"Got it out of his head—and from watching birds fly, too, I reckon," said Uncle Tel. "That boy, he's always snatching time to sit out here on the top of old Hogback Hill, watching buzzards sail, crows flap, and how the lark gives a little spring when she sails up into the sky. Looky here, see that sort of spring, set there where the glider rests on its skid? That's what Buddy calls his 'lark spring up.' It helps him get gliding in a shorter run than he could before he put it there."

The glider and its escort had about reached the crest of the hill now. Raynor stepped a little apart and stood looking down over the lay of the land below him.

"Um—valleys and bare rolling hills," he muttered to himself. "The sort of terrain below to make air currents that rise and flow. The kid's a good picker of gliding country. Reckon though he's been experimenting and studying out this air current business for himself. He's not exactly the kind to leave everything to mere blind chance."

Hal Dane jammed his old cap down on his head nearly to the ears, stood a moment beside his glider. He was a tall, fair boy—fair

at least if he hadn't been so outrageously tanned. His eyes had the Norse hint of "blue fire" to them, like the blue fire of the ice glint of the far north. For a fact, the boy had more than a hint of the old Norse Viking look to him as he stood there beside his wind ship.

His mother, in the fore-edge of the crowd, hands nervously twisting but chin up and eyes steady, might have been the mother of a Viking. Only, instead of watching a son take boat for unknown sea currents, this mother was watching a son mount the even more unknown air currents.

Ducking down to get in under the overhanging wing, Hal seated himself on the board, rammed his back against the upright post that formed the main member of his skeleton fuselage, then doubled up his long legs to set feet on the pair of pedals.

It was rather good sport, this starting Hal off on a flight. The Hillton youngsters had plenty of experience in their end of the matter —which was the pushing and pulling off. On this occasion, when there were so many onlookers, it was a matter to be fought over. Fuz McGinnis, acting as master of ground ceremonies, straightened affairs out and selected those that had already had some experience in pulling off.

At a signal from Hal, half a dozen fellows, three to the left and three to the right, walked away with the ends of a rope that led back in a "V" to the front of the wind bird. At the tip of one wing a tall boy trotted along to hold the wings level. Behind the wind bird, Fuz and another fellow came ambling along, pulling back slightly on a tail rope.

At twenty steps down the hill, Hal shouted, "Run!"

The contraption, which had been slipping along the ground on its keel skid, rose a few feet as the runners picked up speed.

Ten paces more, and the pilot crouching up there under the wing yelled, "Turn loose! Let her go!"

Already the fellow at the wing had stood away. At the yell "Let her go!" the others dropped ropes, which fell free from the down-pointed hooks they had been merely held against by pressure. Now with the back pull relaxed, the glider shot upward and forward like a stone hurled from a catapult.

Wedged between some spruce sticks under a stretch of cloth, Hal was off on his motorless flight.

When on the ground this contraption of wood and wires had seemed an ungainly, waddling freak. But now as it soared upward

on air currents in its sky-element, it swooped with a marvel of grace.

Instead of a short flight and a mere slide down a wind hill, the boy began to twist and turn to take advantage of every rising current of air so as to ascend to a greater height than that from which he had started.

Though he couldn't hear it, the crowd below him let out a gasp of admiration. Rex Raynor stood, head bent back so as not to miss a movement of the rider of the wind.

Already the wind bird had climbed a hundred feet above the take-off; it banked again for another climb. Now it circled, swept in a series of loops, and began to drift easily down a landing at the foot of the starting hill.

Then through the valley swept a gust from the wind clouds that had been rolling up all day. Like a leaf the lazily dropping wind machine was caught up in the blast, swept high again, hurled this way and that, dipping crazily.

"Gosh!" shrieked Fuz McGinnis in a bleat of terror. "Oh, my gosh! He's going to head on his stand!" Fuz always said his words hind part before when he got excited.

CHAPTER IV

WINDS OF CHANCE

Caught in a swirl of air currents, Hal Dane and his craft were hurled this way and that like some toy shot from a giant's hand. Watchers below held their breath.

Although a hundred feet and more intervened between them, those on the ground could see that the boy in the air was exerting every ounce of craftsmanship in his battle with the wind. He banked to the right, now dipped and rose, as though striving to ride the twist of air currents flowing about him, instead of drifting helplessly in their battering clutch. At times the wind ship seemed to whirl completely around, yet mostly it was held to an even keel.

Then the heavens opened and the rain came down in torrents; preluded by lightning and thunder, a cold blast swept down the valley with something of the fury of a small cyclone. Caught in this tempest, the crude plane

bucked and went rearing upward like an affrighted horse.

"There goes the last of Grandma Harrison's sheets," roared Uncle Tel, hardly conscious of what he was saying and charging through the crowd as though he, on his rheumatic old limbs, would keep up with that flying white in the sky above.

"There goes my boy!" thought Mary Dane. It was a silent prayer.

Higher than it had ever gone before surged the wind bird. Storm, darkness, and rain seemed to cut it off from men's sight.

The crowd began to run down the valley, letting the push of the wind guide them in the direction the aircraft must surely be following also. Clinging wet garments and the rain torrent made progress heartbreakingly slow.

Fuz McGinnis turned and began a stumbling progress against the wind back towards the starting point at Hogback. After a while he reappeared, charging along over the roadless, stony valley in his grotesquely inadequate looking Yellow Spider. Into it he somehow crowded Mrs. Dane and Uncle Tel. Others turned back and went for their cars. Raynor caught a ride with someone. Quite a procession went skidding and lumbering through the rain-washed valley.

Then, as quickly as it had come, the summer storm cleared. The sun even came out.

Something white showed up, flapping dismally in a distant tree top. It must be the remains of the wind bird. It—it couldn't be anything else.

Fuz let out the yellow cut-down, speeding by stumps, dodging boulders. From the car behind him he could hear Raynor's voice urging on the driver.

These two cars were by far and away the lead of practically the entire population of Hillton that surged running, walking, riding down the valley.

Mary Dane, and Raynor not far behind her were the first to reach that tree with its flaunting ragged streamers of the wrecked windcraft. Hal was not lying at its foot, battered and crashed. Instead, with blood on his face, and his clothes half torn off, he was gingerly lowering himself from branch to branch. He shinned on down the trunk, dropped beside his mother, and fair picked her up in a great boyish bear hug.

Above him, half of the wind bird hung in streaming tatters from a couple of tree branches. The other half had already descended and lay like a vast white splotch on the ground.

"Reckon I'd better go get the truck and haul this in," said Hal, using his fist to mop blood out of his eye from a cut on the forehead. "I'm sort of used to hauling in the remains and patching up things after every flight. I—"

As man to man, Raynor clapped him on the shoulder and thrust out a hand. "Put her there!" he said.

"I—er—had the luck to land in the soft part of a tree. I—I got down anyway," said Hal gruffly to hide the emotion that was stirring him.

"You got down—but you did more! Man, man! Without any engine, on some sheets strung on sticks, you flew to the clouds, banked, dipped, soared with the best of them, till that whirlwind caught you. Prettiest thing I've seen in years."

"If only that wrong wind hadn't got me," moaned Hal.

"If!" said Raynor, narrowing his eyes. "Aviation's full of ifs, boy—don't let 'em—"

"I won't," said Hal, grinning in spite of the fact that half of his best wind bird was dangling from a branch in a tree top.

* * * * * *

The next day Rex Raynor was leaving. Pilot Osburn had come down to fly him off in

the now fully repaired airplane. After a warm handclasp for all the friends into whose kindness he had dropped, Raynor started to climb up into the cockpit of the R.H.3. Then he stepped back to ground, drew out a notebook and wrote a few lines. He turned to Hal.

"I expected to write you a letter about this. But," with a grin, "aviation's too full of ifs, so—thought I might as well attend to it now while we're together. You saved my life. And you're not the kind of a chap I can get a reward off on. But there's something I want to do for you, and this note will tell you what." He slid the piece of paper into Hal's pocket, then climbed up into his plane.

The pilot removed the blocks, the motor roared, and the R.H.3 taxied forward and zoomed into the air. The boy stared upward until the great plane grew small, became a mere speck, disappeared beyond the horizon. Then he silently turned away from the crowd and headed towards home, walking fast. He rather wanted to get into the privacy of his own old workshop before he opened Raynor's note.

CHAPTER V

CHALLENGING THE AIR

Once within the quiet silence of the old workshop Hal plumped down on a sawhorse and pulled the note out of his pocket.

Quickly he unfolded the paper, and gave a gasp at the contents. It was a note scribbled to the head of the Rand-Elwin Flying School, saying: "Here's a real air-minded boy who risked his life for a flyer. He wants to become one of us, and all he'll need is work to pay for lessons. I think you could use such a boy."

Hal Dane's head was in a whirl as he read and re-read the few scribbled lines. Hal had every right to feel dizzy. Raynor's words were suddenly opening up and making real to him certain vague, misty dreams he had desperately believed would somehow materialize in a far, far distant future.

Instead, they were materializing now—right now—immediately. The boy sitting

rigid on the old sawhorse suddenly shut his eyes, as if the realized dreams were too dazzlingly bright. Flying school—actual training! He'd live with planes—eat, sleep, dream with planes—till he knew every inch of the real machinery of aeromotors. Then a pilot's license! That would open the world for him.

Hal Dane would fly a real plane—make real money. His vision traveled fast. Mother should have everything. No more bending over "taken-in" sewing with weariness pains lacing her bent back and lines deepening in her face. Uncle Tel should have all the pipes, all the books he wanted. They'd do over the old house, renovate it back to its former two-storied elegance, paint, flowers—he'd—the dream circled back on itself and began all over again at airships, Hal Dane aviator!

Hal slid down off the saw bench. He'd write the letter to Rand-Elwin—now.

That same day's mail carried Hal's letter to the Flying School, a fervid boyish epistle stating how enthusiastically hard he'd work if they would only give him the chance. Pinned to it was Raynor's all-important scribble.

A week's space brought the answer. It was a business-like typed sheet signed by the Mr. Rand of the Rand-Elwin.

Crowded as they were with pay students, it was out of the ordinary, he wrote, for them to take one to work out his tuition expenses. But the written recommendation from Mr. Raynor (one of their former men), also a personal visit from him pertaining to this matter in hand, had inclined the school to change its policy in this case. Work would be found for him in the hangars or in the corps of mechanicians. He could expect no money pay for this, of course, but instead would receive the much greater pay of free tuition, board and lodging at the barracks. From Raynor's recommendation, they were expecting great work from him, an interesting flying future—

Hal's eyes traveled back from the pleasant prophecy that closed the communication,—traveled back and riveted upon "no money pay."

It had been foolish of him, of course, but somehow he had never figured at all that there would be "no money pay." He had rosily visioned himself as pulling down some neat sum for his probable labors at sweeping hangars, trundling grease cans, blocking and unblocking plane wheels. Half of this money would have gone to pay flying-tuition, most of the other half would have gone to the folks

back home. In his visioning he had slept in some corner of a hangar, had eaten any old fare.

But now, no money coming in at all, that was different! The vision seemed closing up, drifting away. Mother and Uncle Tel had to eat. He hadn't earned much, but he had earned something, enough to keep their little household going, anyway.

He'd have to stick at this truck job that paid even a pittance of real money—give up this flying vision, this Rand-Elwin offer.

Oh, but how could he? This, his first real chance! In reality it was a full generous thing the Rand-Elwin people were willing to do. They were offering lodging, board and something like a thousand dollars in tuition in exchange for the part-time work of an unknown boy. Only the recommendation of a valuable man like Raynor could have secured him this.

His mother, eyes flashing, head held high, insisted stoutly that of course he must go—his chance—he must take it. Why, she'd manage!

Hal knew exactly how Mary Dane would manage. Sewing, and more sewing, and a pain in the side most of the time. She had put him through high school that way.

Mothers were like that, always insisting that they could do the impossible—and doing it.

Well, his mother had sacrificed herself enough for him. Hal shut his lips fiercely.

The next day his answer went back to the Rand-Elwin Flying School, a letter very different from that first boyishly exuberant communication. This ran: "Sorry—circumstances make it impossible for me to accept your splendid, kindly offer—hope at some future date—"

The clumsy old sliding doors to his barn-hangar were rammed shut, and left shut. Within were the remains of his greatest wind bird. The torn cloth and tangled wires were left undisturbed in their huddled dump. Hal didn't even bother to see what parts were good enough to be rejuvenated into some other variety of gliding apparatus. He just ceased to experiment.

He repaired the old truck instead. He went after hauling business. Several times a week he made double trips to Interborough. Once he made three trips—a haul that worked him twenty-three hours out of the twenty-four. He wanted to work, so that he would be too tired even to think.

Summer passed into autumn.

One day when Hal rattled into the paved

streets of Interborough with a towering combination load of cowhides, lightwood bundles and great blackened sacks of country-burned charcoal, he found himself in the midst of carnival.

Autumn was a period of street fairs. One had strung its booths of shooting galleries, side shows and outdoor aerial trapezes along a roped-off concession on one of the city's side streets. Even this early in the morning, flags and banners flaunted themselves in a chipper gayness. Small dark-skinned people, with a gypsyish, foreign look, busied themselves with settling tent-pins, tautening ropes, setting out their tinsel wares,—calling out now and then in soft, slurring accent.

They might be a travel-grimed lot, these gaudy-costumed traders in tinseled junk and these bandy-legged acrobats. But they had been somewhere, were going somewhere. They caught Hal's imagination, stirred it out of its long, dull dormancy. After he had halted some minutes, while his eyes caught the glint of sunlight on tent tops and fluttering little banners, he shot the juice to the old truck and, stiffening his backbone behind the wheel, rattled off down the street actually whistling. Out across town in an old field behind the warehouse, where he went to deliver

the roll of cowhides, Hal's eye glimpsed something roped down to fence posts and a couple of stakes. A something that sent his heart blood pounding suffocatingly up to his very ears,—an airplane! A battered affair, with the look of having ridden the winds full many a time! But an airplane, for all that.

All the air hunger that Hal had been crushing out of his soul for months surged up, took possession of him overwhelmingly. Leaving his truck standing in the sandy street, he slid down, was over the fence, stood near this air thing roped down against any chance windstorm. For all its lack of paint, the old bus had good points. It was shaped for speed, its wings gave a sense of balance, proportion too.

Hal walked round and round it, hands thrust down into his pockets. He made no attempt to touch it. He knew from his own experience how one hated having outsiders mauling and prodding at one's contrivances. But just standing close, merely looking gave him more pleasure than he had known for most of the past summer. He was so absorbed in contemplation of wires and struts and curve-twist of propeller that he was hardly aware of a knot of men coming down the field towards him. They came in a close-packed group, talking loudly, gesticulating—evi-

dently in heated argument over something. Words shot up like explosives. Snatches of sentences beat into Hal's consciousness.

"But man, you got to—in the contract, flying — stunting—parachuting—everything—" A fat man waved his arms in windmill accompaniment to his argument.

"I know—I know all that," a slender dark fellow with black eyes and a boldly aquiline nose above a square chin interrupted quietly. "I'm willing to fly, I'm willing to stunt. But I gotter have help. I can't sail a bus and parachute drop from it all at the same time—not without crashing my bus, and I ain't going to do that for any fifty dollars a day. Ain't my fault. How'd I know old Boff was going to get sick and quit on me for keeps?" The speaker rammed a hand into his pocket. "Say, wait, I'll do the right thing. You can cancel the whole thing. I'll hand you back the dough you paid for yesterday's work—that'll even up—"

"No, keep the money," a heavy-set fellow said. "It's not the money that's worrying us. It's the advertisement business. The city's paying for the stunts—Trade-in-Interborough Campaign and all that, you know—got posters plastered over the county, newspapers been tooting it up—if we don't give 'em the

thrills we been promising, our country customers pouring in here have got a right to be sore at us. Say, don't you know anybody round about you can pick up to stunt?"

"No-o," the dark fellow shook his head and walked restlessly around the plane, laying a hand affectionately on it here and there. "Boff and I've been out west mostly, don't know any outfits down this way. Sa-a-ay, you get me a man! In a pinch like this, I'll do well by him, give him half the dough."

Half the dough, half of fifty dollars—that would be twenty-five dollars! A madness, evoked perhaps by his sudden contact once more with airmen and airplanes, stirred Hal Dane clear out of himself. Hardly conscious that it was he, Hal Dane, who was doing this fantastic thing, he walked straight into the group.

"I'll take him up on that," he said firmly. "I'll stunt with him!"

"Umph—eh! You've got the nerve, you sound sporting," the flyer whirled and looked him straight up and down. "But no, you're just a youngster. What would folks say if I let you go up and something happened to us—no, no!"

"I'm six feet of man, and make my own living—and I can't help being young," said Hal

whimsically. Then his grin faded and his face set. Now that this fantastic chance was slipping away, he wanted it desperately. "Give me the chance," he pleaded. "There's not a dizzy bone in me, and I've got some idea of balance—"

"Look who it is! That's right what he's telling you, he's got—what you call it—wing sense." Like a small chipper tornado, Harry Nevin, newspaperman, ploughed up from the rear of the group. "Hey, don't you folks remember? This is the kid that got his picture in the Star! Went up with Raynor and brought down Raynor's machine for him, and all that!"

"Oh, so you know about flying, and running sky busses," stated the aviator with relief.

"I know about flying—but, well, not so much about real planes," admitted Hal, honestly.

"He's sailed all over the country on a glider he made himself," broke in the reporter. "He knows more about balance in a minute than most—"

"Have it your own way," burst out the aviator irritably. "Since you're all so set on letting this kid do your stunting, I'll take him up. But the responsibility's on your heads, not mine. And say, you all better clear out and let us get to work. He ain't got but an

hour to be taught all there is to this here stunting business."

While the crowd was departing, some over, some crawling under the three-strand wire fence, the aviator busied himself with peering into the vitals of his ship. Soon though, he raised up, and stalked over to the boy.

"I'm Maben, Max Maben," he said.

"I'm Hal Dane." The boy stuck out his hand and the older man grasped it in a quick strong motion.

"Say, what makes you willing to go up in a strange plane, with a strange flyer, and tackle a lot of stuff you don't know anything about?"

"Got it in the blood, I reckon, this being crazy about wanting to get mixed up in anything that'll keep me near an airship," mumbled Hal. "Anyway, I'd been studying your plane. It looked right to me; I liked its jib," Hal grinned. "Then you came along, and I—well, I reckon I liked your jib, too."

"Guess we're going to get on." And Maben grinned back.

CHAPTER VI

ON THE WING

Hal Dane's blond head was in a whirl. In sixty brief minutes Maben had tried to cram into his cranium all the vast maze of desperately important facts that one needs must master prior to stunting and parachuting.

They were up in the air now, zooming over the city. Young Dane had on his first real flying suit. He leaned back awkwardly against the pack of his parachute. He had never had on one of the things before. There was something else new, the speaking tube with earpieces that fitted up under the helmet. Maben was talking through it now.

"City looks pretty down there—trees and houses all flattened out like pictures on a rug. I'll circle you over the Fairgrounds next, so you can see the clear space you're to come down in. Got a mob to watch us, ain't we?"

Hal felt grateful to Maben. He knew all this kindly rambling talk was indulged in to

keep a raw new amateur stunter's mind off the coming crisis.

Above them the sky was bright and beautiful; scarcely a cloud flecked it. Below them little black dots milled around in every direction. That would be the crowd swarming out to enjoy the vicarious thrill of seeing someone else in the air. There were tiny waving threads that must be flags, and a decorated stand where a band was probably blaring.

"Feel your strap—good and tight—for sure?" Maben's voice rumbled to him. "Got to do my part of the stunting now."

There came a sudden change in the behavior of the plane. Instead of straight flying, Maben began to put it through an intricate series of stunts. He went into nose spins, tail spins, falling leaves, and loop the loops. It was a breath-taking exhibit, at times seemingly reckless beyond all warrant. Yet there was never a slip nor careen to the ship. For perhaps half an hour this continued, then the plane straightened out in a long graceful glide.

"Your time next, kid," muttered Maben, "and for Scott's sake, hold on and be careful. Don't try to give 'em too much for their money."

Hal pulled the earpieces of the speaking

tube from under his helmet and climbed out of the cockpit.

He stood on the lower wing surface, holding on by a strut, waiting. Over his left shoulder he had a glimpse of the pilot's strained face.

Maben was circling the plane lower and lower, flying just above the trees and the grandstand to catch the eye of the crowd.

Ready, go! It was the time. Hal, clinging to the strut, poised to walk out on that wing piece of fragile wood strips and cloth, had the ghastly feeling that his heart had stopped beating. Then its pounding sent the blood roaring to his ears.

No treat, this wing walking business! Suppose the pilot shoved the stick or jazzed the engine!

But Max Maben held his speed to a level; no dropping, no high-riding. Nice work! The ship steady on all axes, calm as a rocking chair in a parlor!

Hal's terror wave passed. He stood free of the strut, walked, bowed, cut a step or two. With a man like Maben at the stick to hold her steady, this was nothing. No more than walking the boards of some earth-bound floor. All you had to do was to keep your mind on your feet, and not look over the edge. Through

Hal shot a sudden daring desire to climb a strut to the top wing of the biplane, to stand there erect, outlined against the sky. He gripped a support preparatory to a climb.

Maben's signal stopped him. It came sharply, the signal they had arranged upon, two quick taps on the fuselage. Hal turned. The pilot was glaring at him from under fiercely drawn brows, and his mouth was in a set line. Swiftly Maben gave the next signal, three taps. That meant the ship was going to climb for altitude for the parachute jump.

The altimeter began to mark up—fifteen hundred, eighteen hundred, two thousand. Maben made a level movement with one hand. That meant all was ready. In slow reversements, Maben held the ship over the center of the field below.

"Go!" tapped the four beats of the signal.

Hal was out on the wing tip. He made a movement towards space, froze back into a crouch and felt frenziedly back at his parachute. Suppose it were not there! Suppose he had never put it on! His fingers touched the compact bulk of the 'chute that dangled gawkily from shoulder straps and belt straps. Hal braced himself, shamed at his childishness. No more fooling. He must go this time.

Steady, go!

Hal Dane stepped off the wing edge and dropped into space.

The pull-off swung him like a toy. Everything went black. He shut his eyes, opened them again. The earth seemed to gyrate below him. Above him, the zoom of the ship.

He must pull the rip cord of the 'chute. No, no—not yet! Must wait, must be no danger of tearing silken fabric against a whirl of the plane.

Down, down. Top speed. Heart in throat. Ghastly shriek of air in his face. His head was going down. He must kick, keep the slant. Maben had said, "Keep your head up—head down gives you one bustin' yank in the middle when she opens up!"

One, two, four, six,—twenty—no use to count heartbeats—heart must have thumped a thousand times by now. No time to waste. Earth looked like it was coming up. Now! Now! He must pull the rip cord!

Down, down. The thing hadn't opened! Suppose—

The great silk lobe opened out with a "pow-a" like a cannon shot.

The lightning speed drop was checked suddenly, and the parachute harness tightened about him at the pull. He seemed to drop no

more. He felt that he was only floating, a mere dot against the immensity of the skies. He seemed an unreality, a swaying atom drifting in the gulfs of space. The earth that a moment ago had seemed coming up to meet him now seemed a thousand miles away. Would he ever come down, touch foot on that earth again?

As the great inverted chalice of the silken parachute ceased its oscillations, the earth also ceased its tremendous rise and fall. It seemed to stand steady below Hal Dane, and he was approaching it faster than he had thought.

The boy suddenly remembered to cross his legs (Max Maben's orders), lest he straddle a telephone wire, a church steeple or something equally disastrous.

A feeling of terrible helplessness was upon him. Nothing that he could do could change his direction. The wind could do that though. A sudden gust could blow him out over water, ram him against a stone building, hurl him before a rushing train.

But no wind arose. He was coming straight down. The crowd below seemed scattering to give him room. He looked up, saw Maben climbing down from the skies to meet him.

On the field, men were running forward to

catch his heels as he touched earth. Many hands helped him hold down against the tug of the parachute, while he worked at the clips of the harness. As the straps fell away and he stepped free, Maben landed and taxied towards him.

"Kid, you did it!" Maben's brown hands gripped his shoulder and turned him about to face the applause of the crowd that had gone crazy with clapping and shouting. Swept away by relaxation of the tense excitement, those near him pounded him, tried to hoist him on shoulders for a parade.

It was Hal's first taste of glory. It thrilled him, but he soon longed to get away from it all. As soon as he could he ducked and escaped and followed in the direction of Maben, whom he had seen trundling the plane into seclusion behind the grandstand.

"Say!" Maben turned on him in mock fierceness, "I'm of a mind to kick you for overstunting on that plane wing. No use being too risky—just plain foolishness, that. But, kid," the aviator's habitually tense face relaxed into a boyish grin. "I'll say you made that come down O. K.,—all jake! An oldtimer couldn't have done it prettier. Listen, I got a proposition I want to make you!"

CHAPTER VII

A ONE-SHIP CARNIVAL

"Hi, sleepy-head, don't you ever get up of a morning? Going to snooze all day?" A couple of resounding smacks against the hammock he swung in startled Hal into semi-wakefulness.

"Um-m, yes," hammock shaking to violent stretchings of its human burden. "Gosh, seems like just a minute since I crawled in. Didn't night pass in a hurry?" Hal stuck a tousled blond head out of his sleeping bag and gazed reproachfully down at Maben, who was already up and, in spite of the crisp autumn chill, was taking a shower bath by the simple expedient of standing in the shallow creek and flinging water all over himself.

It was a strange camping outfit that Maben and Hal had evolved. Instead of a tent, they utilized the upper wing of Maben's old biplane as a roof over their heads. They had constructed hammocks of heavy canvas which

could be suspended, one on each side of the fuselage, up under the top wing. The corners of a hammock were tied to the upper strut fittings, and when a fellow crawled into the three blankets inside, which were sewn up to form a bag, he was prepared for a comfortable night.

Sliding out carefully, so as not to wreck the wing fabric above and below him in any way, Hal stood up, stretched again, then made a speedy dash for a dip in the creek and a leap into clothes.

"My time to cook! I'll get breakfast to pay for oversleeping," shouted Hal, back at the plane and grabbling into the little provision sack tucked under canvas in the cockpit.

The sack contained little enough in the way of foodstuff—some potatoes, a little bacon, nubbin of bread.

As Hal flopped over the sizzle of meat and spuds in the frying-pan and set out the meal in two tin plates, he attended to the job by mere mechanical touch,—his mind was running round in circles. What in the dickens were they going to do? If they spent what little they had buying food, there'd be no money to buy gas. If they bought gas,—no food! Um, better draw their belts tighter and put the cash in gas. No gas meant no stunt

flying—no stunt flying, no crowd to take for rides. And carrying passengers was how they earned their living.

Three states lay between Hal and home.

Maben's proposition had been a wild one—that he and Hal join forces and stunt together over the backwoods country towns. It would be a precarious livelihood. Some days they might cop nothing. Some days they might make a pile. Maben needed a "pile" for his folks back home, his wife, a baby boy, a little daughter just old enough to start school. Maben carried their pictures in a rubbed old case stuck away in an inside pocket. Hal had his home folks on his heart too. He needed to earn money somehow. Even though the mere touch of a plane and the call of the air were a delightful lure, he knew aero-stunting was a risky business. In the end he had decided to tackle it, for a while anyway. So he had rattled the old truck home from Interborough, turned over to his mother the first twenty-five dollars he had ever earned all in a lump, and had joined Maben.

For a while they had made good money. In sections where airplanes had never come or at most had been merely glimpsed—a swift moving speck in the sky that came out of nowhere and disappeared into nowhere—a plane that

really came down to earth was a novelty. As they flew over villages, folks rushed out into the open, heads thrown back, eyes on the sky, arms waving and beckoning excitedly.

After circling to find a good pasture or stubble field from which to operate (a piece of open ground close up to the village being of course most desirable from a showman's point of view), Maben would fly low, and Hal would begin to do wing-walking. If the sight of a young fellow walking and cavorting and skinning-the-cat between wire struts on the wing of a flying plane didn't catch the eye of the crowd, the parachute drop could always be counted on to "get 'em going." After the stunts, Maben would fly low and ease to a perfect landing to show folks how safe it was to come down in an airplane.

After landing, there would always be a heavy barrage of questions—were the wings made of tin or catgut; what was that paddle thing in front; which was worse, to break the nose or the tail; how did it feel to fly, anyway? The answer was that the only way to know how it felt to fly was to try it.

Because a plane was an expensive machine and because it took considerable funds to buy gasoline, the charge for a short sky-ride had to be five dollars.

After one brave native son took his courage in his hands and went up for a flight, others usually crowded in, anxious for their share of the thrills. Once a whole village, out on the gala event of an annual picnic, "took to the air." That night Maben and Hal found they had taken in a hundred and seventy-five dollars. The nickels and dimes and small bills, emptied out of a bulging canvas sack into the dip of a hammock, looked like a young mountain of money. Hal and Maben both had fat checks to send home that week.

Hal had enjoyed visualizing how his mother and Uncle Tel looked when they received his check, liked to picture the comforts in which they could now indulge.

But out here on the edge of Texas business had flopped. They seemed to have struck a belt where planes had become common as dirt, no rarity at all. Other barnstormers must have combed this section well ahead of them. When Hal and Maben zoomed over villages, nobody even bothered to look up.

"We've got to make 'em look," said Maben fiercely, as he mopped the last crumb out of his tin plate, "got to make 'em look—or we don't eat. I've got sort of a plan."

When he and Hal walked into town to see about having a tank of gasoline sent out to the

plane, Maben dropped hints everywhere about a thriller of a high dive they were going to stage, a high dive into the whirlpool below the falls of Faben River, just out of town. Folks that wanted their hair to stand on end better not miss that! Plenty of excitement!

Back at their camp, Maben, chuckling like the big boy he was at heart, worked all the rest of the morning on a contraption made of empty cloth sacks on which he sewed valiantly with a huge needle threaded with stout string. He made four bolster-shaped rolls, a square pillow, a rounded knob, all of them stuffed with dead grass and some mixed sand and clay thrown in for good weight. Then he assembled his six parts, sewed them strongly together into the form of a stiff, stubby dummy man.

That afternoon when Hal and Maben went up in the plane, the dummy man went with them, scrouged down out of sight in the cockpit. Low over the houses and trees flew Maben, with Hal out on a wing tip doing all the stunts he knew. With that air balance that seemed born in him, Hal bowed and whirled on the lower wing, did acrobatics between struts, climbed to the top wing, stood outlined against the sky in daring silhouette. From his swift-moving aerial stage, the boy

shouted down for the crowd to gather at the river bank—last stunt to be pulled there—a thriller!

Higher and higher over the foaming, rocky rapids of the river and its whirlpool below the falls rode the airplane. Flat on his stomach on the lower plane wing, Hal lay stretched out, holding to a wing strut with one hand and reaching into the cockpit with the other. It took every ounce of muscle in him to draw the weighted dummy up, to flatten it on top of him.

Maben was too high to allow a good aim at the tiny blotch of water below. Good aim and quick sinking of the dummy into the whirling waters was the main part of the huge, thrilling joke they were attempting to pull off. Down from eighteen hundred feet to a thousand, to eight hundred—five hundred. The roar of the motor diminished. Max Maben hovered over the pool center in slow reversements and wing slips.

"Quick, shoot him overboard!"

Over the plane edge, down and down went the dummy, waving its arms and legs wildly. Hal felt a ridiculous sympathy for it, it looked so human. Still flattened out and peering warily over the wing, Hal saw it take water in one splendid plunge into oblivion. He saw

people running up and down the bank, pointing,—he was sure they were shouting, only no voices came up to him.

But instead of circling down, straightening out for one of his beautiful easy landings in even the small field that the river valley allowed, Maben began to circle upward, always in the same tight spirals.

Going up now was poor business. Maben ought to be easing down to take advantage of the excited interest his little advertising stunt had aroused.

Hal wriggled forward, stuck a head over to see why Maben didn't go down.

Still circling, the pilot made motions, pointing to the throttle. In a jiffy Hal whirled his long legs around and slid into the cockpit. As he bent close, Maben shouted in his ear:

"Gotter keep going! Throttle's stuck! Can't shut the motor off!"

CHAPTER VIII

RIVER OF THE WIND

Maben kept circling. Beside him, Hal worked desperately, trying every known and unknown device for loosing a stuck throttle. But stuck she stayed.

And the interminable circling kept on. It seemed hours that they rode thus, using up their precious gas in this ridiculous, passengerless flight. Finally Hal crawled out of the cockpit and crept to the front of the wing. He risked thrusting a hand gingerly down in the back of the engine. Finally his searching fingers closed over the obstruction, a slick, bottle-shaped thing with a greasy pointed neck. It was their can of motor oil, carried for emergencies, and it had jarred under the throttle-arm and wedged. Hal tugged and pulled but the grease-covered can seemed to offer no grip for his fingers. He reached in for a closer grasp, set his teeth, and yanked. The obstruction gave, zipped out with such momentum

that the force of Hal's pull nearly shot him backwards off the plane edge. The can spun a thousand feet down through space. Rather white around the mouth, Hal slid back into the safety of the pit.

With a freed throttle, Maben made a landing with all of his usual ease and grace. But there was no one to watch him. The little crowd that their ruse of the diving dummy had assembled for them had long since departed.

So far as barnstorming aviation was concerned, East Texas seemed to be a total loss. Hal and Maben swooped down to their camp, gathered up their very limited assortment of housekeeping necessities, and set wing for further westward.

Within the week they hit a line of carnivals and country fairs.

With so much competition in the way of stunt flyers and aerial circuses, any newcomer on the scene must think up something out of the ordinary if he expected to make a living with his sky bus. And with necessity fostering invention, Hal's brain conjured up the something.

Even on these little half-mile country tracks, the auto racer was replacing the old-time horse racer. Hal's agile imagination leaped

a step further. Why not race car against airplane? The one on the ground, the one in the air, but both racing in the same limited circle in full view of the grandstand?

It was so revolutionary an idea that at first no one would listen to him. A laugh in the face was all he got for his explanations of how to manage this new thrill-offering.

Then the manager of the lively carnival in swing at Repton caught Hal's vision. On his track was staged their first auto-aero race. There was a spice of danger to the thing—at least for the aerial part of it. To speed a plane in a little half-mile circuit takes a master hand at the stick. But Maben had that master hand. He could make a sky bus do almost anything in reason.

Above the tiny circuit of the dirt track he had to bank his old plane pretty nearly straight up and down and zoom around like a bee in a bottle. To keep from winning too soon and ruining the show, he had to throttle down her motor until the last lap. Then he'd let the sky bus out and show the boys what she could do. Below him the begoggled auto speed-fiend would let his ground ship out too and smoke his wheels on turns, but the sky bus always won.

The auto-aero race was a success, a wow!

It caught the fancy of the crowds and gave them more thrills than they knew were left in this thrill-worn universe. The air-earth races kept the Repton Fair open a week longer than had been counted upon. After its closing, Hal and Maben drifted on to other fairs and found good money waiting for them almost everywhere they touched. Sometimes they took in twenty-five dollars a day, but more often it was seventy-five, and now and again they reached the hundred mark.

At Zenner, Hal had the thrill of buying himself a plane. It was an old J-1 Standard, the type of ship the army used to train pilots before the war. Its owner had made one flight in it and had come down to a perfect one-point landing—straight on the nose—and smashed up everything.

Max Maben knew points though when it came to planes, and advised Hal to buy. They made Zenner their headquarters for a while and radiated out from it to do carnival flying. Between times they worked on the plane. In the end they evolved a patched-up creation built with homemade spars, a second-hand engine and rusty fittings that had to be painted over. But she flew like a bird. The carnival season was closing in. Hal used the old J-1 Standard to double their earnings by

flying races at one fair while Max filled his schedule at other fairs.

But for all her sweet flying, the Standard wasn't altogether a lucky plane. Some nemesis of mischance seemed to dog her flights more often than not. Once when the two flyers had her out for a pleasure spin that took them hedgehopping over mountain tops and skimming the warm air softness of the desert edge, the false darkness of a windstorm swooped around them and sent them earthward for a forced landing. In the dimness they took to ground between the cactus and Spanish dagger covering old fields. And here they stayed the better part of a week. As they landed, a villain of a Spanish dagger plant had slashed through the front spar of a wing. It took half a day to patch the ten-inch gap in the spar and to sew up a dozen rips in the wing fabric. It took half a week of cutting sagebrush and cactus to clear enough space for a take-off runway.

But whether the old J-1 Standard was a lucky bird or not, possession of it began to stir in Hal Dane a slow, subtle change. Ownership of a plane of his own awoke in him vast longings and hopes. In spare moments he was always tinkering lovingly around the old bus, seeing if a wire tightened here didn't make

her wing edge better, or if a heavier wire coil above the landing gear didn't make her taxi along sweet. Now and again when he had a spell off from carnival work, he took the "J" up on long, high solo flights.

On one of these lonely air journeys he pushed higher than ever before. The vast altitudes were always luring the boy, held a fascination for him. Zooming up into the ether till from land he might seem some mere speck in the sky had long since ceased to awake in him any nervous terrors. Instead, he reveled in the sense of space and freedom the heights gave him. Aerial intuition showed him that, within limits, the higher he was, the safer he was. An engine break a hundred feet above ground, where room for soaring tactics was limited and the parachute of no account, was a much more terrible danger than a similar accident two miles high. The heights meant safety from rough ground air; ten or fifteen thousand feet often meant safety from storms.

Up and up Hal pushed his rough-built, patched-winged old army relic, reveling wildly in the freedom of the skies, fourteen, fifteen, sixteen thousand feet up. Intense cold froze him to the marrow, chattered his teeth. Air pressure weighted his brain, reeled his head

dizzily. If only he had some protecting, oxygen-piped helmet to protect him from air heights, as a diver had helmet to save him from water pressure! If—if! Then he could explore the great unknown of the air! But even at a puny sixteen-thousand-foot height, the sky had revelations for one that soared its spaces knowingly.

Once in his high flying, Hal was swept into the vast power of a great westward flowing current of air. A veritable river of the wind. It swept him on fast and faster. Exhilaration shot through the boy's being. Speed! Power! Here was power waiting to be harnessed by man. Westward on a river of the wind!

A thousand years ago his Norse ancestors had swept westward on ocean currents, the rivers of the sea, to find a new land. Some day, he, Hal Dane must sweep westward on a river of the wind to discover—what?

He longed to fly onward forever as he was now, with a speed wind under his wings. But the cold was devouring him, the awesome pressure was roaring into his brain. Anger at his puny man's impotence in the face of such power shook him. He could bear no more, the air weights were smothering him. Downward he began to drop in long swoops.

As altitude had plunged him into a baptism of ice, so earth, as he swooped downward, seemed to have prepared for him a baptism of fire.

Below him, in great gusts, yellow-edged billows of black smoke clouds poured up. Funnels of sparks blasted up on the winds and scattered to shower back into an inferno of flames.

Hal swerved aside, but sent his plane in a huge circuit nearer earth, so that without danger he could inform himself concerning this disaster.

It was a barn in flames—the great red barn of some lonely ranch place. Crammed as it must be with hay and wheat shocks, it had become a roaring furnace, spouting flames up into the very skies.

Disastrously near to the doomed barn was the house. The little white farmhouse seemed to crouch pitiably, seemed almost a human thing, earth-bound and with fire-death sweeping against it.

As Hal circled nearer, he could see little frantic specks that were human beings running back and forth with futile buckets of water. From experience out here, Hal had come to know something of the water dearth of the plains. What avail were the few hun-

dred gallons of water in a little cistern against this raging fire monster?

But the human specks fought on madly. The barn was doomed. They were fighting for the house. Up went the buckets of precious water to wet down the roof. Now they were spreading sopping blankets. And to what use? The wind was veering more, the sparks were showering continuously. For one flaming shingle stamped out, two more leaped into blaze.

Like one fascinated by danger, Hal circled nearer. It was madness. A spark on his wing, curl of flame bursting out of the inflammable lacquer pigment—then the death crash.

But this little white house was somebody's home—his all!

The boy flung caution from him. He dropped low, aimed his plane straight out. With a zoom of the mighty wind-makers of his wings, he drove forward down the air lane between the flaming hell of the barn and the little crouching house in its imminent doom.

In his wake swept vast air currents swirled upward by the speed of his passage, a wind wall that turned back spark and flames from showering on the house roof.

His own wings had dodged sparks somehow, run the fire gauntlet unscathed this one time.

It was risking fate, but Hal Dane wheeled his aircraft and shot again down the dangers of that fire-fenced air lane.

Hal Dane was using his plane like a gigantic fan to combat the fire's spread. His very speed must have shed the falling dangers of sparks from his own wings.

Full forty times he drove his ship back and forth between the little house and the flaming barn, making mighty air currents that turned back the peril like a shield of the wind.

The fire-riddled structure collapsed, shooting flames enormously high, then settled into a smouldering mass. This might burn on for days, but its real menace to the farmhouse was ended.

With danger conquered, Hal Dane, like some crusader of the air, whirled skyward, incognito. Those he had saved would never know who had saved them.

But flame and danger had strangely stirred the boy's heart, had fired his ambition into a steady glow that henceforth was to flinch at nothing.

Emotion—inspiration—a medley of feelings surged up in him as he swirled high into the sky. Higher, higher, back again into the mighty rushing currents of the rivers of the winds! To what did that current flow west-

ward? Some day he must explore it—must know.

High, and higher, till the air pressure sang heavily against his brain. Here in the heights the lure of still another adventure was calling him—the adventure of invention. The world was waiting for that—waiting for man to pit his brain against the dangers of the great ethereal upper strata. Man must conquer air heights as he had conquered earth heights.

It was a new Hal Dane that came down from this sky flight. He was no longer a boy, satisfied with clowning above a carnival in an air machine. In his mind burned a definite desire to master aeronautics instead of merely drifting aimlessly, satisfied to dabble in air flying.

Along with ambition he had the hard common sense to know that he must go back and begin at the bottom, lay his foundations right if he meant to climb high.

That night he mailed a letter to the Rand-Elwin Flying School. Days later the answer came, stating that he could still have the work and the tuition in that organization that he had applied for once before. Hal was both surprised and pleased to read that Rex Raynor was now one of the flying instructors in the school.

With the chill of winter beginning to creep

over the great southern stretches of Texas, the season of country fairs and carnivals came to a close. Maben was anxious now to get home for a short visit with his family. After that he meant to try for some practical, year-around work—the air mail, or forest ranger air service. And Hal had his own ambitious plans burning within him.

At the Louisiana-Texas border town of Aldon, he and Maben parted company. It was a wrench for both of them. But then they could cheer their hearts with the knowledge that the science of flying was making the world smaller every day. All through life, he and Maben would likely enough be meeting at various landing fields—to "ground fly" and joke about their lurid carnival past.

Barnstorming might have been the slapstick life, but both Hal and Maben could be thankful for their period of buzzing a plane above country fairs—their work had brought them in enough money to keep their families comfortable for some months to come.

Hal was also ahead an additional five hundred from the sale of his old plane. He could embark with an easy mind on what promised to be the greatest adventure, so far, in his life.

CHAPTER IX

GROUND WORK

Before Hal Dane lay the great unknown—the three thousand parts of a dissected D. C. engine.

"And I've got to get 'em together," he moaned. "Gosh, was it to assort engine-hash that I went through all I've stood lately?"

Hal Dane had been on a strain, of a sort.

As soon as he landed at the far-stretching, smooth acres of the Rand-Elwin Field, bounded by hangars, barracks, instruction halls, he had passed the inspection of Mr. Rand at the office, inspection of short, dark, imperturbable Major Weston, primary instructor, passed test-inspection for every ailment in the world—or so it had seemed.

Hal had to undergo examination for heart action, and short-sightedness, and color blindness, and sense of balance and equilibrium. He was thumped and spun and eye-tested till he began to imagine that he really must have

some outlandish physical defects. It came as an exhilarating shock to him when the doctor thumped him in the back and grunted, "Umph,—prime condition,—fellow with a constitution like that could fly to the moon!"

So Hal was turned over to Major Weston for training in the elementary principles of flying.

In relief at his acceptance, Hal's hopes flew high.

But hopes were all that flew high. Hal Dane in person was kept pretty low, smudging at a lot of engine junk that didn't look like it was ever meant to fit together.

To Instructor Weston aviation was neither a sport nor an experiment. It was a business. Under him a student was taught an aerial groundwork as solid as a railroad rock bed.

Since the internal-combustion gasoline engine was the accepted, standardized motor power for aircraft flight, Major Weston saw to it that his pupils knew internal-combustion gasoline engines—else they didn't graduate into the next class.

For Hal, the lessons seemed to go on interminably about the valve, the piston, ignition, spark, carburetor. He endured all the miseries of a brilliant pianist given to performing by "ear" who is set down in a primer class to

learn note reading and scales. He began to feel that the outside of the ship, wing beauty, pull of propeller, soaring power, were what had fascinated him—not greasy, grimy intricacies of engines. In fact, heretofore engines had not entered very much into his aerial plans. He had known how to crank them, and fly them, and that had seemed enough.

But at Rand-Elwin, engines loomed large. He had been here for weeks, and so far had not been allowed even the feel of a ship—except the Puddle Duck, and one couldn't call that a ship.

The Puddle Duck was an atrocity. It was a stubby, short-winged boat with no more grace of movement than the land-waddle of that barnyard fowl for which it had been named. The chunky plane, for all its ridiculous wing effect, was merely a land ship. In it, pupils studying balance taxied madly across the turf, striving to keep its misshapen body at proper angle—an impossibility. How could one keep such an unbalanced blob balanced?

Hal could have shed buckets full of tears over his efforts at the joy stick of the Puddle Duck. He who had flown real ships tied to this thing!

A huge surprise to young Dane was the finding of Fuz McGinnis as an upper-classman here. There had been no chance for writing or receiving letters in the past months of Hal's track-hopping at various country fairs. Circumstances had forced him out of touch with Old Fuz and the rest of the home gang. And now here was McGinnis grades ahead of him, doing flights in a late model sky ship while he wrestled with the Puddle Duck.

He and Fuz eagerly fell back into the old jolly comradeship in the little time school duties allowed.

For Hal, time seemed forever filled with motors,—motors in sections, motors in mixed masses waiting for him to learn their functions and to reassemble their anatomies.

Only gritted teeth and the sputtering flicker of his river of the wind ambition held him to his bewildering task day after day. He thought he hated motors.

Then in a blinding flash of understanding, he began to "see" engines, to grasp their mechanical beauty.

It was the marvel of the piston that first got him. He began to sense something of the power of that driving force that man has learned to harness. It had taken man thousands of years to learn to explode a mixture

of gasoline vapor and air in an engine's cylinder where a piston caught the force to hurl forward power in a four-stroke cycle. That four-stroke cycle could speed an automobile over the highway or a wind ship over the airways.

And he, Hal Dane, had fretted at giving a few weeks to study this master power! Realization came to him of how primitive were all his notions of aircraft as compared with the perfection man had already reached. Into the building of one airship had to go the knowledge of more than half a hundred crafts and trades.

Instead of mere rods and tubes of metal, Hal now saw pistons and cylinders as power-containers. To help his understanding, he visualized how a pinch of gunpowder can easily be put into a gun cartridge. But when the powder is exploded it expands into gases that would fill a house. It is the expansion that shoots the bullet. So it was that the air-gas mixture exploded in a cylinder rushed out to force the piston into unbelievable speed. This speed harnessed to gear and camshaft was the power that was hurling the motor world forward—first on wheels, now on wings.

Hal forgot grease and grime in the sheer wonder of mechanism. Those black engines

of iron, steel, aluminum and alloy became beautiful—more beautiful than the spread wings that had once fascinated him entirely. For motors gave power to those wings.

Instead of hastening from ground work into flying, as he could have done, Hal went back into classes for a second course in engine work.

Because Hal showed promise, Major Weston laid the work on him, uncompromisingly made him dig for what he got. But after class hours, a friendship sprang up between the blond boy and the short, heavy-set pilot trainer. Engines were their meat!

Hal was beginning to master the intricacies of motors, from the old seven thousand part Spano Motor down through its more modern descendant, the three thousand part D. C. Motor.

Engine mechanism was marvelous, was complicated—too complicated. Even after he understood the wondrous power and pull in unison of the D. C., Hal's brain rebelled somewhat at the involvement of even this latest build of motors. Man was smart to have made so complicated a thing—but man would have been more of a marvel to have made a simple thing that would perform the same work.

"But," questioned Hal of his instructor-

friend, "for the air motor, every ounce of weight removed means power saved; now what—what could be taken from such an engine, and still leave efficiency?"

"But what? But why?"

In their after-school confabs, Weston's experience and Hal's theory and hopes fought many an acrimonious friendly battle. Raynor, who as advanced-flying pilot was for the present out of Hal's school sector, sometimes of a night joined in these air battles fought out on the ground. All manner of past and modern experiments came under the fire of their discussions. Aeronautical engine builders seemed to have tried out many varieties of motors. There were the long ago experiments with steam engines for airplanes. The engine itself could be made much lighter than the gasoline engine, but the fuel and water added so much weight that the whole combination was far too heavy for air purposes. Mercury and other liquids were tried out without much success. Then came gasoline and mercury-vapor turbines, fine in principle but somehow unsuccessful. There was a flaw that needed some genius to find it.

"The turbine principle is the coming change," argued Weston. "If the turbine principle could be applied to an aeronautical

engine, it would eradicate many of the present troubles."

"But engine makers can't seem to apply it," contended Hal. "Seems to me," he hazarded his next thought gingerly, "that the engine without batteries is going to be the thing. Batteries weigh an awful lot. How about this high-degree compressed fuel and the way it explodes under pressure in the cylinder—without the ordinary explosion by electric spark? That would cut out batteries and save weight—"

"Save battery weight, yes!" countered Weston out of his deeper knowledge, "but how about the five hundred pound pressure to the square inch needed to explode such engine fuel?"

And so the arguments ran on. But for all the seeming impracticability, Hal's mind was focused on the experiments with the new type engine with which certain inventors were struggling. It appeared to the boy so much simpler and safer an engine, with its few parts, its more flying hours per given weight of fuel. Not now, but some day—perhaps.

Fuz McGinnis was specializing in wings, not engines. Engines as they were suited him well enough. Quite often though he came in to take silent part in these nightly symposiums

held over the ills and blessings of motors. He sat in the discussion for love of the companionship of this oddly assorted trio of thinkers.

As spring came on, Hal went from ground work back again into air flight. He found the routine of flying tests easy, because the inner workings of engine mechanics seemed etched on his very brain. The feel of wings stirred him, roused all the old wild exhilaration of flight. And yet he was more critical of air machinery than in the past. Where before he had been vastly satisfied with the mechanisms of man-flight, he now caught himself wondering continually why man had not made his machines the better to withstand certain shocks that were bound to come in any flying routine. Flying gear had made progress, but landing gear was still crude, still based on land-moving machinery, instead of machinery of the air.

Pondering these things, Hal found his mind working back to the piston-and-cylinder that gave engines their power, their thrust. Why couldn't this same piston-and-cylinder principle be used to lessen power for a landing gear? His thoughts hung to this strange idea, revolved the thing continually in his mind.

Then one night he set before Weston and Raynor his ponderings and plans.

"It's the crack and crash of quick landings that break up so many planes." The boy spread his ideas gingerly before these two experienced old heads, fearing the laugh over some ridiculous flaw that his reasoning might have passed up. "Seems to me man hasn't got so far in what he lands on! Oh, of course he's gone a little way, passed from a sled base to wheels, then made the wheels larger and put pneumatic tires on 'em! But at that, any kind of speed landing bangs a fellow with a recoil like a rammed cannon. Now suppose between the ship and the landing gear we had a new kind of shock absorbers—sort of buffers made up of long cylinders with pistons in them, containing oil or glycerine, or some fluid like that, wouldn't they—"

"Hum—say—yes—"

Raynor and Weston were leaning forward, all absorbed in following this young fellow's reasoning, this radical plunge into something far out of the ordinary rounds of mechanisms. One piston-and-cylinder principle had been harnessed to a gasoline vapor explosion to hurl a motor forward. Now here was this fellow's futuristic brain seeing another piston-and-cylinder principle harnessed in oil or glycerin to gentle power and ease a speed plane to the ground in a shockless landing!

Long into the night the three of them discussed the idea from all angles. It was his friends' advice that he keep his plans to himself—for a while anyway. Then if the right backing ever came along, something worth while might be developed out of the thing. Any dabblings in invention needed money to back them.

Out on the field, Hal went from week to week through the different grades of flying. Although he had done a deal of actual flying before he ever entered the school, the precise, thorough routine training of the Rand-Elwin took no account of this. With flight, as with engine study, he was made to start at the bottom and was then given the "whole works." He had to begin with learning the controls, pass from that to their application, then to straight and even flying, climbs, banks.

One day out on the flying field, Hal stood, neck cracked back, eyes glued to the sky, watching a plane that seemed to have gone mad in the heights. He was sure it was Raynor. He had seen Raynor take off just before. Must be his ship. Yet he had never seen Raynor double-daring death like that before.

CHAPTER X

SAFETY AND DANGER

Far above Hal Dane, Raynor's airplane shot into a fantastic rolling and twisting and turning, falling like a withered leaf, springing to life and hurling upward, stalling at wrong angles, behaving like some crazed thing of the skies.

Then Raynor volplaned to a beautiful landing, taxied across the turf, got out and strolled over to Hal.

"Now you go up and take a try at that," he ordered.

"Umph—I mean, sir—oh, sure!" muttered Hal, backing off a little and looking amazed. Had the careful, conservative Raynor gone out of his head?

"I mean it," said Raynor. Then his eyes began to twinkle. "It's all in the course. Only you're not to do it all by yourself the first few dozen times. You'll go up with me till you get the hang of it from watching."

Signaling for mechanics to take charge of his ship to give it the regular cleaning and overhauling after flights, he led the way towards the hangars for another machine.

As they walked, Raynor launched into his explanation.

"If a man wants to fly conservatively, he's first got to learn to stunt. May sound crazy, but it's a tested truth. It's a known fact now that a fourth of all the real crashes happen because a fellow got into a tail spin and didn't know how to get out of it. And the pilots in these crashes are mostly the youngsters, not the veterans. When a flyer has lived long enough with aviation to be considered a veteran, he usually knows by instinct what to do in a spin, doesn't have to stop and think 'What button shall I push?'

"Aviation school has caught the idea now that it's a pretty good thing to send a pupil up with an old-timer who can put a bus into spins and take it out of spins. If the pupil watches close enough, he automatically learns the movements. It's the latest aviation insurance against a crash!"

A plane had been rolled out and warmed up. They climbed in. Raynor ran quick fingers along the straps that bound them both to their seats, making certain that all was secure, then

he gave the word for the blocks to be knocked away from in front of the machine.

With a roar of the motor they were off, speeding up at an angle that soon had them a thousand feet above earth.

Hal Dane felt a catch of pure excitement in his breath. This was going to be different from any flying he had ever known. Heretofore it had been "keep up speed, avoid stalls, and thus avoid the fatal spin." Now Raynor was deliberately taking him into the danger of stall and spin! Raynor was deliberately taking him into the dangers he might incur if fog, sleet or rain caught him, if unknown mountains loomed suddenly ahead, if storm winds hurled him out of balance.

They rode higher still; then the pilot suddenly shot sickeningly into the Chandelle, that zooming, sharply-banked turnabout.

He went into nose spins, and came out. Went into tail spins, and came out.

He took Hal through side-drifts and grapevines and the fluttering leaf, then righted the ship while one held the breath.

Raynor took the ship high again, then dived.

The next instant Hal was hanging by his middle from the safety belt, while the ship careened across the landscape absolutely upside down. Earth and sky swung round. To

one hanging thus in dizzy space, the green earth suddenly looked crushingly hard.

The earth was coming up to meet them. It could not be three hundred—no, not two hundred feet distant. It was the end. Raynor had gone too far—lost control—he must have—

Hal steeled his nerves to try to meet the crash without a shriek.

But even while he held his breath to a sobbing gasp, the ship rolled over slowly and easily into normal flying position, and came to earth with all the grace of a perfect three-point landing.

The rolling earth ceased rolling. Hal Dane sat in a limp daze, like one come back from beyond a veiled, blank interim. Then his senses swept back to him.

So Raynor had known what he was about all the time. It was no accident. Knowingly he had gone into the back-dive and come out with the famous slow roll.

Two weeks after that Hal Dane was doing his own slow rolls, doing his spins and his Immelmanns. He practiced continually, with Raynor coaching him. High over a safe landing field, the pilot showed him all sorts of tricks and dodges, showed him how to extricate his ship from every conceivable position.

Here was carefulness in a new form. The

Rand-Elwin School tried to look ahead, to foresee dangers, then to train its flyers to meet that danger capably.

Storm, fog, ice-weighted wings—these were natural adversities that aviators must circumvent as best they might.

But there was still one worse danger—the danger of carelessness.

The instructors strove to teach air-minded youngsters the arts of mechanical safety. In the air courses it was a cause for demerit, for expulsion from school even, for a pupil to fall into some mechanical danger that forethought could have avoided.

A horrible event impressed forever into Hal Dane's mind the penalty one paid for mechanical carelessness.

At mid-day, one of the students in advanced flying had gone up to give an exhibition in reverse controls, turns and spirals.

He was a marvelous flyer in spite of a certain bland recklessness that seemed to edge his every act. Now in the air he seemed to short-turn in his spirals, to be given to shooting into perilous climbs. He was that way in all his work, sliding through with a swagger carelessness. As he watched the pupil aviator now in the air, Hal's mind went back to events of that very morning, how the fellow had gone

slipshod through the tiresome routine of overhauling the engine of the machine he was to use in the noon flight.

Some god of luck must ride that fellow's shoulder. For here he was up, flying a dirty motor that would have clogged on anybody else, yet gliding through dives and figure eights with the easy grace of a whirlwind.

A score of pupils and an instructor or two stood on the field below, heads bent back, watching the beautiful stalls and spins. Again he shot high into the air in a circling swoop. Then while everyone stared aloft, a little puff of flame darted out from the engine.

"It has back-fired—hot carbon showering from that dirty engine!" moaned Hal between white lips.

For a dazed second everyone stood paralyzed with horror while above them another flame shot out, darting towards the carburetor.

The next second the aviation field came alive. Rex Raynor leaped to a machine, a rope was hurled in after him, frenzied hands whirled the motor, shot the blocks from under the wheels.

Up into the sky with meteoric swiftness rose Raynor.

Below him, men stared upward, faces tensed

with anguish as they watched his maneuvers. What could he do? What help could he be now?

With every moment it seemed that the burning plane must whirl downward and dash its lone occupant to death. Tongues of flame licked about it, reaching greedily for its vitals —the controls. The wings of the plane had been dipped in a fireproofing process, but now even these were smouldering.

Evidently the cockpit had become unbearable, for the watchers on the ground descried a figure creeping piteously out on a smoking wing stretch.

Charred bits began to float down. Raynor was circling in, shortening his wide spirals, dodging to the windward of flaming, floating particles.

Why didn't he hurry? Why didn't he swoop in—now? Ah-h-h, the agony of it! The doomed machine would be falling apart. It shot flaring through the skies like a bird of fire.

Crouched on its furthest wing tip rode the hapless young aviator, head bent away from the searing heat that was creeping out and out to him.

CHAPTER XI

AN AERIAL MESSAGE

Raynor seemed to have drawn as near as he could to the burning plane; he hovered a little above it.

The next instant a coil of rope shot down, fell across the wing below. In a flash the victim of the fire-trap had it in a noose under his arms and swung himself clear of the already crackling wing.

As Raynor gently eased upward to take up any slack in the rope, the flying death below him burst into flame and began to collapse. Some of the struts burned through and pieces flew into the radius of the propeller, which instantly smashed to pieces. Three seconds later the machine began to fall. It staggered, wheeled sideways and dived. Like a stone it hurled groundward on the edge of the aviation field.

The crowd scattered in all directions, fleeing from sparks, charred wing pieces, explo-

sion of fuel tank. A hangar roof caught fire and the chemical guns had to be turned on to put out the blaze.

Raynor was coming down now, with his dangling burden swinging beneath the plane.

The crowd massed again, followed his progress with anxious eyes. How was he going to make it? Would his helpless, half-fainting burden swing against building or tree tops, would he be ground-dragged? There was the lake. Would he risk a water landing?

Fuz and Hal, eyes strained upward, shoulder to shoulder in the crowd, seemed to feel their hearts beat as one.

"If only he could drop us word what he wants us to do," moaned Fuz. "Needs his radio, or something in the sky—"

"He could telegraph us," said Hal, "if—"

"If he had that old dot-and-dash system we used to hammer to each other on water pipes —only he's got nothing to hammer—Jumping Jerusalem!" shrieked Fuz. "He's downing come—I mean, come downing—oh-h-h!" and excitement mixed Fuz's words for him in the old childish manner.

And down Raynor came. With no system of ground communication on his boat, he had to come as best he could and trust to luck.

Nearer down swung the roped burden.

Folks could see now why the boy had never jumped from the death-trap of the burning plane—his parachute pack hung in scorched shreds. Sparks must have done for him there first of all.

Sensing a ground-drag, Raynor rose a bit, then lowered, and with masterly hand held the ship to steady placement in air, while men reached upward to receive the boy. Someone had had presence of mind to stand by with opened knife—a slash at the rope and the boy was free. They laid him out, insensible, but with life still in him—a marvel, after the danger he had incurred.

Raynor landed farther out, taxied in. He crawled from his ship with knees trembling beneath him. The strain on him had been terrific.

Now that it was all over, Hal found his own limbs quivering. This thing had unnerved him—and others too. All about him he saw men with lips still white from the strain, bodies relaxed, huddling against some support.

He had thought that in the face of such near-tragedy, school schedule would be broken, the remaining flights for the day be put off. But no—already an instructor had swung round in quick reproof on a boy who had developed nerves and was begging off.

"Planes out for the next flight up!" barked the pilot. "Danger is the aviator's schoolmaster—we must learn from everything."

On his way to the hangar, Hal passed Fuz, already climbing in a cockpit, and whispered, "I've thought of something— am going to send you a message in the sky—listen for it."

For the flyers in the sky, the rest of the afternoon was a busy time. With each student in his plane went a data board and on it he was to do map-work, but not the usual maps that land folks know.

This was the class in meteorology, or the study of the air itself. Hal Dane was finding that flying was a complex vocation. Acquiring aircraft knowledge required study in such varied directions—study of iron and steel and linen and silk, the compass and oils and combustion, and now today, the study of what effect the sun has on the earth.

The sun, Hal decided, was the cause of a great deal of trouble. As he studied, he found that the sun by shining brightly in the morning heated up the earth and the air above it. Then the warm air expanded and took up moisture. In the afternoon, when the sun began to go down, the air cooled and descended towards earth. And that was where troubles generated. In the cooling, particles of air moisture

condensed, then electricity accumulated—then next, like as not, a thunderstorm burst.

An aviator had to know these and a million other things, so as to gauge oncoming air disturbances, and dodge twisters and storm winds by dropping to a calmer level, or rising above storm.

In the days of his old glider experiments, Hal had found for himself that winds are generally prevalent over waters, and that hills make rising currents one can soar upon.

Now this deeper study of winds and fogs, of up and down currents, of the startlingly strange effects that water, forests and deserts have upon air currents—all this fascinated him.

As he read the air-speed indication and the altitude on his instruments, his busy hand drew waves and spiral lines on his data board —his map, showing currents and lay-out of the air stratum he had been assigned to.

He loved the work, could have kept at it hours longer, but dusk was coming on, the other planes were already dropping down.

Old Fuz was still up. Hal suddenly remembered the ridiculous whispered promise he had made to Fuz. He began to circle the other plane, sending his own engine into a sharp staccato sputtering: "T-t-t-tat t-tat tat!"

Hal swept closer. "T-tat t-tat!" roared his engine.

Fuz must be working his brain overtime on wavy line maps, must be asleep at the stick or something. It was exasperating. And he had told Fuz to be on the lookout.

Hal zoomed high, then circled low again, sending his engine into such a sputter that it began to miss and he had to shoot the juice to it and fly straight for a stretch.

Fuz was a dumb-head, he was a—

Of a sudden Hal broke out into a laugh and whirled his plane back into his circling above the landing field.

A staccato t-t-t-tat from the other plane had answered him. Good old Fuz, he hadn't forgotten after all!

For half an hour longer the two boys circled high and low in the air, making their engines "talk" in a sputter of aerial telegraphy based on the old dot-and-dash code they had worked out long ago in their tappings on land things, on stones, on water pipe.

With practice, they found they could speed and cut the engine to series of staccato barks that simulated fair enough the tap of a telegraph instrument. They felt foolishly exuberant and tapped each other all kinds of messages.

They landed in the dusk with planes gassy with engine fumes, but with happy-go-lucky laughter in their own hearts.

It was laughter that soon ceased, for each walked straight into the grasp of an enraged official, posted to wait for them.

"Your flying days are over," each was informed, and was ordered to report to the office after the evening meal.

Neither Hal nor Fuz had any hankering for supper that night. As soon as the seemingly endless meal was over, they hurried, rather white-lipped, to the office.

There they found awaiting them, assembled like a judge and jury, Mr. Rand, Colonel Elwin himself, Raynor, Weston and a couple of other instructors. Raynor and Weston had the drawn, haggard look of men sitting in at their own execution. There was a hard firmness on the faces of the other men.

Hal Dane sought with agony in his heart for the clue to this summons to appear before a judgment seat—this summons and the verdict already rendered, "Your flying days are over," that had dropped like a ton of rock on all his hopes, crushed out his whole future. And it was happening so close to what would have been the first glorious upward step in his career,—his graduation from an ac-

credited aviation school. With the Rand-Elwin O. K. on him he could have secured a flying job anywhere—the flying world would have been open to him.

What would his mother and Uncle Tel do—how would he ever go back to them, broken under some sort of disgrace—

Hal's misery of trapped thoughts whirling madly in his brain was interrupted by the firm harshness of Colonel Elwin's voice.

"I have here," his hands turning over several cards and slips of paper, "reports from various ground officials that you two students stayed in the air an hour overtime this afternoon, tampering with engines, and riding with motors missing—when every principle of air flight warns a flyer to seek a landing when his motor misses. No matter how well a man flies, we can never make an aviator out of him if he hasn't sense enough to know that he is in deadly peril if he continues to fly a missing engine. A knock in a motor presages engine trouble, and engine trouble presages a forced landing. At the first hint of mechanical defection, it's a flyer's duty to head down and make as speedy and safe a landing as possible—"

"I—" Hal Dane opened his mouth to speak, then closed it. No words seemed to come.

Colonel Elwin went on without pause, as though he had heard no interruption.

"It is, of course, a disappointment to us to have this serious flaw in your flying ability revealed. Especially since one of you boys had been brought to our notice as having rather a genius for mechanics, a talent for engines and an outlook for the future of motors from an aerial viewpoint. That's what makes it so heinous, so foolish for one who knows engines to be willing to tamper with them dangerously in mid-air, to risk valuable life and valuable machinery.

"What, may I ask, was your idea in generating peril for yourselves up in the air?"

"We—I mean—I was testing out a sort of aerial telegraphy," Hal finally got the words out, "and—"

"Aerial telegraphy—what?" both Mr. Rand and Colonel Elwin seemed to ejaculate simultaneously.

"It was my fault, not McGinnis's," said Hal, stiffening his back a little, and trying to keep his voice firm. "I thought it up and got him to try it out with me—"

"I was in it as much as Hal Dane," Fuz seemed to have found his voice. "I'm plumb due to get washed out if he is."

"Aerial telegraphy—what was your idea—

how were you managing it?" Mr. Rand leaned forward.

"You see Fuz McGinnis and I have known each other always. We used to have a secret dot-and-dash code when we lived back home, used to tap each other messages." Hal seemed to forget for the moment that he was up before the "Benzine Board," was being washed out of flying forever perhaps. He warmed to his subject. "It just occurred to me that while we were up in the air, it might come in pretty handy sometime to send the other fellow a message. You might need to tell him something, or ask for help quick! The motor running is about all you can hear in the airplane. So it just came to me to take a try at making the motor do the talking, to cut it and race it in a sort of code."

"Did it work?" questioned Mr. Rand.

"It sure did!" Fuz answered. "Dane asked me if I was hungry, and I tapped back to him I could eat a—"

"So it did work," put in Mr. Rand. "Interesting—"

"Quite interesting, and quite dangerous!" Colonel Elwin's dry, hard voice took up the case again. "You boys risked clogging your motors, and weakening down the exhaust valves, incandescence from carbon!"

"But don't you think—" Mr. Rand had the floor again—"don't you think that since it was not mere useless daredeviltry but a real experiment that these boys were trying out, that we might—"

"Well—er, yes, I might be made to see it that way." A ghost of a smile tugged at Colonel Elwin's iron mouth. "Shall we let this case drop into what we call suspended judgment?"

"Ah-h!" A vast sigh of relief burst from both boys.

"But remember," Elwin's jaw settled back into its iron firmness, "the judgment still hangs over you—it's merely suspended. No more tampering with engines in the air."

CHAPTER XII

QUICK ACTION

Against fluffy white clouds below a bright blue sky, an airplane spread its graceful shape.

Down on the Rand-Elwin field a host of students and visitors watched that ship of the air. Its pilot was Hal Dane. For a space he cradled along, a mere speck gently floating up there in the immensity of the ether. Then like a mad thing his ship began to fall, rolling and twisting and turning. At impossible angles it came to life, righted itself to spring upward—only to fall into worse dilemmas. Now he was diving, only two hundred feet above earth, and flying upside down. On the verge of crash, and in an agonizing slow roll, the ship slid back into normal flying position. High again—then a dangerous glide over the dragging tops of trees, and only the climbing reversal of the Chandelle saving him from wreck. Young Dane began to fall into the

most deadly spin of them all, the whirling stall. He verged on that spin, yet never quite permitted it to become a spin. Instead, he slipped and stalled and trod the air until he fought his plane back into safety.

It might seem that young Dane was a daredevil fool risking both his neck and his plane in a useless show-off. But the group watching from the Rand-Elwin field knew there was a purpose and a real reason behind every one of these stunts. Hal Dane had been sent up to demonstrate that the Rand-Elwin School prepared its flyers to face practically every known emergency. Deliberately Hal Dane had forced his ship into spins and stalls that many a pilot would have come out of—in a casket and with a lily in his hand. Instead, with the stored-up skill bought of splendid teaching and relentless practice, the boy rolled or whipped or glided out of every danger.

Dropping out of freak flying into a series of long, swooping curves, Hal descended toward the field and made a landing so gently that he would hardly have jarred a glass of water on a dinner table.

Other flyers went up. There were planes all over the sky, outdoing themselves in loops and spins and whirls.

This was a big day at the Rand-Elwin field,

Colonel Bob Wiljohn, a man of immense wealth and interested in the future of aviation, was a guest of the school. As part owner in the Wiljohn Airplane factories, at Axion, he was acting as representative of his firm in a search for young pilots of sufficient training and capability to handle their makes of planes as demonstrators. It was a compliment to an air school to have a man like Colonel Wiljohn inspect its student ranks in search of men for his aviation program.

After lunch and an inspection of equipment, rooms and hangars, the Colonel and his constant companion, his grandson Jacky Wiljohn, were out on the field again.

Colonel Wiljohn was a tall, muscular man, with a look of youth in his keen gray eyes despite the lines on his tanned face and his white hair. The type of man that kept young by his intense interest in big things and the future trend of affairs. Jacky, his grandson, was getting aviation in the blood at an early age. The little fellow with his close-clipped hair and wide-open black eyes, must have been only five or thereabouts, yet he could speak familiarly of water-cooled engine, and struts, and spar, and other lingo of aircraft.

The Colonel was not only a builder of planes, but also a flyer of some note. It was natural

that he should want to view the Rand-Elwin field from the air as well as from the ground.

Hal could see one of the big, new trimotors being trundled out for his use. A pilot in helmet and flying clothes warmed her up and slid under the controls. Hal's eyes widened. It was Fuz—Fuz McGinnis that was to take her up. Some honor for the old boy! He'd liked to have been in Fuz's boots himself. But Fuz deserved it; he was a crack airman, that boy.

Colonel Wiljohn and Jacky, the youngster grinning happily over his miniature aviation togs, were already aboard.

Down the runway came the plane, maneuvered some slight obstruction, then gathered speed and soared into the air like a great bird of the skies.

McGinnis must be on his mettle; he had achieved the rise full two hundred yards within the end of the runway. A brisk shout of admiration followed his take-off—then the shout died into a composite gasp of dismay.

"The wheel—look!"

Just at the rise of the plane, the wheel on the left side had crumpled and now swung a useless, dangerous mass beneath the ship.

"Mercy on him," moaned Hal, "half his landing gear ruined! He's in for a smash!"

"Ninety-nine chances out of a hundred are against him," half-whispered Rex Raynor who was standing near, eyes glued on the beautiful plane circling so gracefully in the sky above.

Both he and Hal knew well enough what was likely to happen when the aviator came down to a landing with only one wheel to make the ground contact. A crash, an overturn, a complete capsizing that would spell the end for the occupants. And that boy Jacky in there too, a young life to be so horribly snuffed out.

None of the occupants of the ship were aware of what had happened. They circled serenely, while all unknown to them a death trap swung beneath their speeding plane. That slight obstruction on the runway must have cracked the gear, but the actual buckling of the wheel must not have occurred till the very moment of the take-off, and so had passed unnoticed.

For the throng of sightseers crowding the field, the dangle of broken gear had slight significance as to the terrible danger it presaged. But every student, pilot and mechanic knew what must eventually happen—unless the aviator in the damaged ship could be warned!

On the ground, men rushed about, shouting, pointing to gear of other machines, hoping to attract the attention of those in the air.

But for the flyers in the roaring ship, the shouts from far-away human pin-points on the earth below must have been as mere whispers, as nothing at all. There was no sign that any of this ground commotion ever reached the ship.

Other pilots began to rush out machines and warm them up, preparatory to rising in the air to carry their warning shouts and pantomime within closer range of the damaged sky ship.

Raynor was one of the first of these. Even as he raced his engine for the take-off, Hal Dane shouted after him, "Wait—I'll be with you—give me one second!"

With strength that he had hardly known was in him, the boy wrenched off the whole metal-spoked wheel of a bicycle that leaned against a hangar wall. The next instant he had leaped to the cockpit, carrying the wrenched, wracked piece of machinery with him. With that broken wheel he hoped to pantomime, to talk in dumb show, and reach the doomed flyers where shouting failed.

To overtake them was the problem of the next moment.

The great trimotor had risen high in the air, and instead of circling over the various sections of the Rand-Elwin field had zoomed off into a sudden flight at a speed that would soon make it a diminishing speck on the horizon.

Other planes darted after it, striving desperately to hang on to its tail, to keep some glimpse of it in eye. Once lost from view, the plane would be doomed—none to warn it—a crash in some landing field!

But the trimotor had speed, and the start. The diminishing speck became an atom, became nothing—the vast universe of the sky swallowed it up.

Pursuit ships began to turn back. It looked too hopeless. None knew where the big ship was headed. With no track or clew to follow, even a slight deviation now at the beginning of the flight would lead them into a diverging angle miles and miles away from the true course of the damaged plane.

Raynor was among the few that held doggedly on. Because his boat was a fast one, he was leaving the others. He plunged straight ahead in a course he seemed to have set for himself from the beginning.

Once he called through the tube, "Clanton—commercial field — Wiljohn left packet of papers there—must be going back for them—"

It was a desperate chance. Wiljohn might be going to any of a hundred places. Even if they sighted a ship and tailed it into Clanton, it might prove to be any of the thousands of sky craft that filled the air these days.

Still it was the only clew they had. They could follow it blindly—that was all.

Twenty-three miles from the Rand-Elwin Field to Clanton! With its newer speed and power, the big ship could make it in say nine-tenths of their own flying time. A mere fraction of time, a few moments out of all eternity! Yet those few moments could spell death to three unwarned passengers.

On the fringes of Clanton, Raynor overhauled a few leisurely flying ships from the commercial field. On ahead, and drifting back through their hum, was another and more powerful sound of motors. That could be the trimotor. If it were not, then their whole desperate race had been in vain.

They were now pressing up towards that larger ship, whatever it was, that was leading them into Clanton. Its motors seemed to reduce ever so slightly—cutting in for the landing field, it must be.

Raynor was making it in with every ounce of speed, pushing forward, overhauling the big boat by faint degrees. He must make it

now, catch her before the ground swoop, circle her to give the warning signals.

Hal, with a hurried call to the pilot, slipped the hearing tube from under his helmet, and began a swift clambering out on the plane wing. The thrill of the old circus stunt days was upon him. He felt the old surges of power and balance shoot through him as he wing-walked, went to the very tip, carrying with him his signal of the broken bicycle wheel.

He must catch Fuz's attention. Colonel Wiljohn's, little Jacky's even—make one of the three see him, sense the danger message he would pantomime. If necessary, he would climb aloft to upper wing space, circus-stunt there silhouetted against the sky,—anything to catch the eye!

Fuz his friend, this gray-haired grandfather, this child—any risk to save them!

But as Hal prepared to climb struts to the plane top, he saw it was too late. Time had passed for catching any eye by acrobatics now.

Like a meteor, the boy shot down the length of the plane wing, dropped back into the pit. In a frenzy, he shouted through the tube, "Risk it with me—one chance—give me the control!"

It was a risk, in more ways than one. With an instructor from his flying school beside him, Hal Dane began to disobey orders, began a stunt that must mean the end of his flying certificate.

Already the trimotor was circling for the glide to landing—and to death!

There was no time left to ride abreast, to wave, to make any signal for the eye. But there was the ear, the hearing, still a last chance left to try. Even though Raynor's ship rode behind, it could send sound traveling forward through the air. Would Fuz McGinnis catch that sound?

In an agony, Hal Dane cut the motor, speeded it. Cut, speed! Cut, speed! "T-t-t-tat t-tat t-tat!" The old code, the call!

Through the air, Hal sent wave after wave of sputtering sound, a staccato call, "S. O. S. —danger—keep flying!"

But McGinnis in the plane ahead seemed deaf to any sound save the roar of his own motor.

He was swooping low—and lower!

CHAPTER XIII

VISION

Hal Dane was above the trimotor now, and was still sending out his desperate aerial telegraph call, "T-t-t-tat tat-t-tat t-tat—danger—keep flying—danger!"

He had raced and choked and pounded his engine till smoke fumes discharged gassily from it. The next sputter might stall a filthy motor to a "conk" in mid-air, might back-fire flame into the carburetor. Yet the message must still go on. Three lives depended on that one hairbreadth chance.

"Danger—keep flying!"

But the trimotor was going down. It swooped to five hundred—three hundred—began to flatten at two hundred feet for the last lap of the down glide.

"Danger! Danger! Danger!" shrieked the tortured staccato of the higher plane. "Danger! Danger! Keep flying!"

Even as the great plane below swooped to

strike earth, its pilot lifted wings in a mighty upward dart. Higher and higher he rose. Behind him trailed his own call in aerial telegraphy. "Danger—where—what?" roared the staccato bellow of the trimotor.

In their brief code, Hal Dane tapped back the answer on his engine, and urged return flight to the school aviation field before attempting the landing.

As Raynor and Hal circled near, they could see McGinnis turn the control over to Colonel Wiljohn. Then the boy climbed out over the side of the plane and swung head downward to see if he could reach the broken gear and perhaps lash it back into place.

A hopeless task, it appeared, for Fuz McGinnis slowly dragged himself back into the cockpit. Soon the plane circled and headed back for the Rand-Elwin grounds.

All that wild race to Clanton had taken a bare fifteen minutes. Another quarter of an hour saw them back above the home field.

Raynor and Hal made their descent in record time, leaped from the plane and raced for the edge of the field. Men jostled together to give these two room. Like the rest of the waiting throng they stood, heads back, eyes glued to the crippled sky craft.

"She's coming—now!" It was a whisper, a

prayer that came from every heart and lip in the crowd.

The plane was coming down in wide, slow circles.

"Atta boy, you're bringing her in beautifully—yet every odd's against you!" gritted Raynor through set teeth.

"But he's got a chance, one chance," muttered Hal, gripping Rex Raynor's arm and pointing excitedly. "If he keeps to the balance he's got—runs on that one wheel to lose momentum, it can—"

It could.

Fuz McGinnis held his plane to angle of balance, even as he sped half a hundred feet on the one wheel after he struck ground. Then came a tearing, splintering crash as the plane shot sideways, dragging the down wing into mangled wreckage. Even so, the greatest danger mark had been passed. That one-wheel run had spent the worst of the dread momentum.

Guards held the frantic crowd back while experienced hands tore at the wreckage, lifted out the occupants. The three of them were dazed, bruised, cut about hands and face from flying pieces of wood and fabric. But the miracle of it—they were alive, practically unhurt.

Fuz McGinnis stood for a long minute leaning weakly against the tilted mass of wing debris. His face held the look of one who has been on a far journey and is not quite sure he is really on home land once again. As he came out of his daze, he leaned over and gripped Hal Dane in a shaky grasp.

"B-boy," he said, "if you hadn't that message us to got—no, no, got that message to us, I mean, we'd have been—"

"We'd have been dead," broke in Colonel Wiljohn. "But you brought the word, in a blasted clever way. You turned some sort of tomfoolery into lifesaving. We owe our lives to you both. I—I—we thank you." Reaching down, Colonel Wiljohn swept his grandson into his arms, pressed the child against his face. Then he set the little fellow down and gravely instructed him to give a handshake of thanks to each of the young fellows.

The crowd would be denied no longer. It broke through the guards, surged over to the little group beside the wreck. Women laughed and sobbed in relief as they saw the child standing unhurt, clinging to his grandfather's hand. Men laughed huskily and tried to hide emotion in heavy handclasps. They wanted the whole story,—how had McGinnis brought her down without a worse wreck,

where had Raynor and young Dane found them, got the warning across to them?

It was full thirty minutes before the crowd could be dispersed so wreckers could haul off the disabled plane, and so the aviators in this thrilling episode could slip away to some place of quiet and rest.

That night Hal Dane and Fuz McGinnis attended their first banquet. It was not altogether an unmixed pleasure—this the first formal festival in the whole of their work-filled young lives. The fact that they were seated rather high was not altogether comforting to their timidity, either. This was the celebration that had been planned weeks ahead of time and was staged to do honor to the school's guest, Colonel Wiljohn. Then here at the eleventh hour, so to speak, and at the Colonel's especial request, this couple of young aviators had been dragged in to sit next to him.

It was comforting to feel the Colonel's kindly presence but even that did not compensate entirely for the unmitigated terror of a startling array of forks with varying uses staring balefully up at one from the heavy linen of a banquet cloth. One felt conspicuous in such a dazzle of lights, in such a gathering of notables.

"I'm not much up on banquets," hoarsely whispered Hal under cover of a speech by one of the notables. "Y-you don't reckon anybody'll expect us to say anything?"

"Gosh, no!" from Fuz. "Anybody could look at us and know we couldn't talk. But something else is bothering me—"

"Bothering me, too," mumbled Hal, and subsided glumly beside a plate of broiled chicken, green peas and mushrooms in ramekins, potatoes in some newfangled way, a spiced jelly.

Colonel Bob Wiljohn responded to a speech of welcome. Other speeches followed.

Then Hal Dane and Fuz McGinnis became redly aware that Mr. Rand, standing very erect beside the table, was talking in a serious voice and mentioning their names considerably.

"The blow's going to fall now," Hal's lips silently sent a message to his chum.

"We have here an extraordinary case." Mr. Rand's voice was stern. "It concerns two of our most brilliant pupils in aviation—and on the eve of their graduation. Although under a sentence of suspended judgment already, they have now risked locking the doors of graduation on themselves forever by flagrant disobedience of strict orders—"

"I protest—" Colonel Wiljohn was on his feet, gray eyes flashing. "Your words give the wrong impression. You mean two boys entered a risk to save a valuable plane if possible, to save human lives—"

"Wait, wait! And I accept your protest, Colonel." Mr. Rand's eyes also held a flash, a high enthusiasm, his stern mouth relaxed into a smile. "I want to state further that we, the board of officers of this institution, had already decided—against all past precedent and rules—to ignore said flagrant act of disobedience, and to graduate these two young men—with honors!"

Waves of hand-clapping and cheers broke over a couple of dazed young aviators.

"So the—" Fuz muttered.

"The 'Benzine Board' didn't get us after all," finished Hal.

That very night Colonel Wiljohn had a long talk with the boys and offered them work. He could use them well. They had both displayed an uncanny aptitude for flying, and he needed plane demonstrators. Hal's instructors, Raynor and Major Weston, had told him enough about the boy's unusual grasp of engine mechanics to arouse his interest. This keen, successful business man got up and walked the floor in his excitement as he and Hal

delved further into the boy's future-looking ideas for invention in harnessing piston power for landing planes gently and with a lessening of landing dangers. His factories, he said, were willing to pay well for brains, needed young fellows with vision, both in the flying and in the invention departments. Would they consider coming with him?

Would they?

Young McGinnis quite emphatically mixed his words hind-part-before in the fervor of assuring Colonel Wiljohn of his willingness to go.

For the space of a minute Hal Dane sat perfectly still, eyes wide open, but in them the look of a man in a dream. He was in a dream; this was the beginning of visions about to come true. It couldn't be real. He'd wake up—

"I'm counting on you." Colonel Wiljohn's strong, friendly hand grasped his shoulder.

"I—yes, sir—I'll be on hand," Hal finally got out.

Leaving the Rand-Elwin Flying School seemed to Hal like turning over one of the busiest, happiest pages of his life. He parted from his splendid, true friends here with real regret. Yet, like all youth, he was eager to turn the next page of life.

Before he entered upon his new work, there was time for a brief visit with his home folks. He found the old house still uprearing its makeshift patchwork roof among the tree tops. Within, though, the money that he'd managed to save and send home in carnival days had wrought some comfortable changes. There were rugs, dainty curtains, a piece or two of new furniture. He found his mother and Uncle Tel not so ground down with toil these days. In his mind, Hal was already looking forward to other changes—a roof, and a coat of creamy white paint for the house, a little car so the folks could get around —just wait till he began making some real money!

* * * * * *

For Hal Dane, life at the Wiljohn Works promised to be the greatest thrill he had ever known. Up till now he had not realized the vast extent, both in space and operations, of a modern aviation factory. It was not one factory, but many. There was a bewildering variety to the output.

Hal had thought the Works concentrated on some special type of plane. Instead, he found them manufacturing about everything from a small, neat sky boat for private use up to giant craft for freight and passenger air-

liners. There were air boats with wings that folded up so one could trundle them into the family garage instead of into a hangar.

Over in the invention department tests of all kinds were being continually conducted. With his keen gray eyes looking well to the future, Colonel Wiljohn was willing to try out in his laboratories things which to more conservative men seemed mere schemes and addle-pated ideas. If a scheme failed in the testing, it was just another visionary mechanism to be set aside. If one idea out of ten, out of a hundred even, proved to have worth, aviation had made a forward step!

In the parachute department strange weaves of silk were being tested for qualities and purposes that silk makers of fifty years ago never dreamed would ever be demanded of their products. According to laboratory decision, the habutai silk in present use for parachutes would soon be displaced by a new weave, the basket-mesh type. And why? Because the basket-weave oscillated less than the old habutai type, it absorbed shock better, it lowered more slowly and allowed for better landings. Silk that once fulfilled its purpose if it had a sheen and gloss to catch milady's eye! And now it was demanded that it have a strength to lower man ten thousand feet

through the air without a jostle and land him on earth without a bruise!

In the engine room, motors were being tried out for streamlines and cooling systems, for weight reduction and elimination of fire hazards, for burning new high-powered fuel oils.

Where the prevailing wing material had formerly been wood and fabric, tests were now being made to prove the worth of all-metal construction. For new purposes the old-time metallic standbys were found unusable. Light metals crystallized and snapped into brittle pieces. The old strong metals possessed of endurance were too heavy for aircraft. A new metal, light as aluminum and strong as steel, must be produced.

And so the experimenting and testing went on.

As Hal Dane became familiar with some of the scientific revolution and evolution going on at the huge Wiljohn Works, he caught again something of the high splendid vision of following the river of the wind on a great exploration. If ever he were to go as sky viking, here in this vast plant were being riveted and welded aircraft suitable to bear him on that journey.

CHAPTER XIV

DOWN THROUGH THE AIR

With wire braces screaming, a plane shot downward a thousand feet and the pilot struggled to bring his ship out of the left spin.

The pilot was Hal Dane. He had been with the Wiljohn Works nearly a year now. In that time he had participated in some marvelous experiments, tried out in the hope of furthering the safety of aviation.

A room painted black, strung with wires, some bats turned loose in it, and doors and windows closed to darken it totally—this might seem childish dabbling when thought of in connection with the modern science of aviation. Yet it was a test tried out with a very real purpose. Outside of that room men waited at ear-phones connected electrically with those wires so that the least flutter of a bat's wing against a wire would be indicated. The bats flew madly round and round the room, but never so much as touched one of

the many wires. From this experiment scientists contended that bats flying in the air put out some sound and get an echo from that sound when it vibrates near an object. Not so far and foolish a leap from bats to aviation after all! For if a human flyer of the air could devise a ship that put out a sound and got an echo when it approached an object, it would help solve the problem of landing in the dark and of flying in fogs.

Fog, the heavy, silent, dreaded enemy of every aviator! At the Wiljohn Works continuous experimentation went on to help solve the dangers of fog flying. An electrical instrument to measure distance from the ground in tens of feet would help an aviator trying to land in the dark. A mechanical eye to see through the fog was a crying need. Work was being pushed along both of these lines.

Another and very different type of experimentation was the testing of the wings and shapes of aircraft in connection with their air resistance.

The tests for great altitude, however, thrilled Hal Dane more than anything else. Through all this present labor and study, the call of the river of the winds still lured him. And to ride the currents of the air rivers at

their swiftest, one must be able to withstand the velocities and the pressure of the air heights. The fearful cold of high altitudes unbalanced ships with heavy coatings of ice, clogged instruments and air indicator tubes with snow. Wiljohn men were pushing experiments for such flying. Already a spread of emulsions on the wings had been found to reduce the ice danger. But for real success, aviators must learn to wholly master the air heights.

Still another type of work was the testing of completed planes. No Wiljohn ship was permitted to leave the factory until it had been thoroughly tried out.

Hal Dane was up in one of these new planes now—and was coming down in a wrong spin.

It was a new type training ship that the navy had ordered. In the work it was built for, the plane might never be put to any particular stress and strain. Yet no flyer can predict what risk may suddenly be thrust upon any ship up in the air. So, like all planes constructed at the Wiljohn Works, it had to be subjected to the worst conditions that might ever overtake any aviator.

All in the course of his usual everyday work, Hal Dane had been ordered to take her up and put her through her paces. First he

was to shoot for altitude, next dive vertically, full engine, for eight thousand feet, then straighten out to volplane safely to ground in circling glides.

At twelve thousand feet he had gone into the dive, but instead of falling straight, some faulty mechanism of the ship had hurled it into the dread left spin. Many an aviator would have crawled out then and sought safety in a parachute jump. Young Dane had gone up to test this ship, and test it he would, fighting it down to a last margin for a safety leap.

Three times he exerted every ounce of strength that was in him towards a right pull so that the torque or twisting force of the motor would bring him out of the spin. But the machine would not respond. Another thousand feet—a wrench! And, ah, he had done it, she was coming straight! Mentally, Hal began cataloging the spiraling, the drop, the wrench he had just been through, trying to visualize the engine faults that had brought these on. Too much weight here, not enough strength there. Bad faults, but there were remedies.

She was diving pretty now, straight on, like something shot out of a cannon mouth.

Then at seven thousand feet down things

began to happen. Before Hal Dane could realize it, the ship literally shattered to pieces under him. A crash, a rending, a tearing!

He jack-knifed forward across the safety belt and force hurled him head-on against the board, knocking him unconscious. A fuselage gone crazy, wings torn off, tail torn off, shot in sickening whirls towards the ground. Strapped to it, rode Hal Dane, stunned into the unconsciousness of "little death," while real death rose up with the ground to meet him.

As he fell, rushing air partly cleared his brain. But a flying-man's instinct, not conscious thought, set his hands to fumbling the safety belt, to feeling for the ring of his parachute cord. Instinct freed him, sent him climbing to the edge to step off into space.

Things happen swiftly in the air. The ship had already fallen a thousand feet while her pilot rode her down in his dazed condition. But even now it was still some three thousand feet up—more than half a mile above earth. As Hal leaped out, he looked back over his shoulder to see in what direction the stripped fuselage was heading.

A moment more and he was hurtling down through space! Now the wreckage of the ship was even with him, now it had passed

him, its greater weight carrying it fast and faster.

Hal's fumbling fingers tugged at his rip cord. He was falling head on—ages swept past—would she never open? Then the parachute blossomed into a great blessed silken flower above him. The silk went taut, yanked him back into an upright position. Beneath the inverted chalice he floated. The earth had ceased to rush up to meet him. It stayed where it belonged—no, it was floating gently up to meet him now. He was going out of his head again, losing his grip on himself. Quick, before blackness went over him again, he must choose a place to land!

He looked down, heard a crash as the ship hit the ground. An airpath seemed sucking him down, hurtling him on to land in the very midst of the wreckage. Bad landing—flames might burst out in that twisted mass below him!

Before his brain went blank again, he must side slip, veer his parachute in a different direction. With instinctive, mechanical motion, his fingers reached up, caught a cluster of shrouds in his hand and drew them down little by little, spilling air from the 'chute. His speed increased as the drop veered off at a sharp gliding angle.

All over. That must be ground below.

But instead of solid contact, there came a splash.

One moment Hal Dane's feet struck water, the next moment he went down, engulfed!

CHAPTER XV

TWO ROADS TO FAME

Next thing Hal knew, he felt land grating against him. A strong hand had him by the collar dragging him out of the water, many voices beat into his ears.

"Oh-h-h, by Jehoshaphat Jumping!" yelled Fuz McGinnis as he threw his arms about Hal's dripping form. "We'd given up hope, never believed we'd find you all in one piece!"

"It's a miracle." Colonel Wiljohn slid an arm around Hal's waist to help him over to the waiting automobile. "That dashed faulty plane came down in shreds, spars gone here, wings drifted yonder. I couldn't tell in heaven's name where you were going to smash. I shot cars and stretchers out in every direction. And now I find you floating on our lake, calm as somebody on a bed of roses—"

"T-too bad I disappointed everybody by coming down all in one p-p-piece!" chattered the dripping Hal.

"Hush, boy! No joking! Never have I suffered such agony. I'm a thousand years older." Colonel Wiljohn yanked off his coat and wrapped it around Hal. "Never, my young friend, never shall I let you or any of my aviators test out such a machine as this again."

But Hal Dane did take up this same type of ship again. He did it at his own risk, and at his urgent insistence. From his perilous performance in mid-air he thought that he knew what were the faults of construction that had caused the ship to shatter under strain. Previous work in his department, the risk department, had taught him to learn something of real value to flying from every accident. In this case, he asked for the chance to prove what he had learned. So weeks later, he took up the very same type of ship, greatly strengthened, and put her through the same test. This time he and the ship went up and came down together, none the worse for wear, and he could write O. K. on her examination sheet.

Testing other people's inventions did not fill all of Hal's time. At nights, or whenever he could snatch a few hours to himself, he was forever pottering with pieces of fabric and metal and wood. Table top, dresser top, every

available surface in his sleeping quarters seemed cluttered with aviation trash. Only not all of it was trash. Mixed in with wood shavings and screws and wire coils was a strange metal helmet, something like a diver's helmet, yet different, — light, graceful, not cumbersome in shape. A tube could be attached to the mouth-piece. Elsewhere in the litter sat a miniature oxygen tank. In these was expressed a forward thought for achievement in high flying. Little models of engines rubbed noses with wing models in various stages of incompleteness. Above a chifferobe was poised something that Hal Dane's eyes sought every time he entered his room—a completed model of a plane. It was a slim silver creation, all metal, and streamlined from engine, through monoplane wing, back to tail. Slender, yet with strength in every line! Smoke blown against this model did not eddy and swirl but slipped straight across her nonresistant lines. With her length of wing, she was built to ride the winds.

For a wonder, Hal Dane was not studying the beloved lines of his tiny, silvered wind bird tonight. Instead, his fingers were fiddling with a little flying toy manipulated by a couple of twisted rubber bands to furnish motive power. If he twisted the rubber tight

enough, the little windmill fans of the toy shot it up to the ceiling. In the midst of one of these flights, there came a sharp knock on the door, and while Hal leaped to open it, the little wind toy drifted down from the ceiling about as straight as it had gone up.

In the open doorway stood Colonel Wiljohn, his fingers gripping a folded paper, his eyes shining with an eager light as he watched the wind toy whirl down.

"You've got it—made a start on it anyway!" the Colonel slapped the paper across his palm excitedly.

"Sir—I've got it—what?" Hal stammered in amazement.

"This thing," Colonel Wiljohn stooped to rescue the little wind toy from where it had fluttered to the floor. "It seems like Fate that you should be experimenting with such an idea just when I come to bring you a certain piece of news."

The Colonel cleared a space on the cluttered table, and spread open the paper he had brought. Its black headlines announced:

"The great Onheim prize offer—twenty-five thousand dollars for the best safety device for airships."

"See," Colonel Wiljohn's finger emphasized the points, "twenty-five thousand dollars—

safety device. And already, without knowledge of the money behind it, you were working on a safety device—helicopter principle, is it not?"

"Not exactly helicopter—more of a gyroscope," Hal caught something of the Colonel's fire. "It's been on my mind a long time that one of the greatest dangers of aviation is the huge space 'most any ship needs to come to earth on. I've looked death mighty straight in the eye some several times when forced landings smacked me down in a tree top or on a gully edge—when if I could have come down zup! straight like the drop of a plummet, I could have landed with a safety margin in some small clear spot—"

"A small space to rise from is sometimes as great a danger for a plane as a forced landing, too," interrupted the Colonel. "Say you're forced down on a mountain ledge, or a tiny island—the average plane is done for then. Has to be deserted to its fate for the lack of a long, smooth runway needed for the forward glide before the rise. Were you figuring on the straight-up rise, as well as the straight-down drop, with this heli—, I mean gyroscope business?"

"In a way," Hal answered as he began to fit together certain scattered bits of miniature

machinery, picking up the pieces out of the mixture on the table. Under his hands grew a little short-wing airplane with a motor and a propeller on the nose. Above it were set fans like a windmill, only they lay horizontally a-top the wings.

"It's the position of balance that I've been working for," went on Hal, setting the little plane on his open palm and spinning the miniature gyroscope with a motion of his other hand.

So far as a stationary plane was concerned, the principle of the gyroscope seemed to work out well. For no matter how Hal tilted his palm to throw the plane off its balance, the whirl of the wings above it was able to apply power to the controls to steady it back into upright position.

Colonel Wiljohn took the model into his own hands, studied it eagerly, turning it about to examine minutely its tiny mechanism. "This row of slot-like holes—in the air tube here," the Colonel held the thing closer to the light, "what's the idea in that?"

"You'll laugh when you know what put that idea in my head." Hal grinned a little sheepishly as he thought about it. "I got it from watching something that never was in any way intended to fly, something that no one

ever thought of in connection with flying at all—a player piano!"

"A player piano—huh!" The Colonel turned about so sharply that he nearly spilled the plane model out of his grasp. "How in the deuce did you ever extract an idea on aviation out of one of those contraptions?"

"The thing just came to me all of a sudden one day when I was watching one of those mechanical pianos pounding out that ghostly sort of music where the piano keys press up and down, and the music blares out, but no human hand touches the keys. Through the glass front, I was watching the paper roll in the piano, how it passed in front of a place where air was applied. The air was blown through the little holes in the paper, thus striking the keys and playing the piano. Right then the idea got me that when the airplane gets off the horizontal or longitudinal axis, a stream of air blowing through small holes in a gyroscopic instrument could strike the controls with the strength of a powerful hand, thus bringing the plane back to its normal position—"

"Right O, that's just what it does, too!" The Colonel thoughtfully spun the wind wheels of the toy and watched how the thing righted itself, no matter how he tilted it. "You've got

the biggest thing of the age here, boy, if it just works out right in real flying mechanisms! Bring your plans out to the laboratories this week and let's work the thing out in a real powered model."

For weeks to come, Hal Dane was up to the ears in work on his gyroscope. And Colonel Wiljohn hung over him like a hen with one chick, as eager as any boy over the outcome of this revolutionary scheme of applying player-piano principles to airships.

At last a model was done, an all-metal miniature, perfect as any real service-flight plane, even to the engine on its nose. But in many phases it ignored the known rules for making the regulation type plane. It had small, fixed wing surfaces, without even an attempt at ailerons. The rear spread into an unknown fantasy of a biplaned tail. On a metal framework above the body of the plane were affixed four limber metal rotor blades that hung with a flimsy droop when the plane was still.

Colonel Wiljohn's countenance drooped somewhat when he saw the finished product. This model, so much larger than the tiny creation he had balanced on his palm that night in Hal's room, had an awkward, fearfully flimsy look. Was this the thing he had pinned such faith to a few weeks ago?

Then the motor of the big toy was warmed up. Flimsy blades, that a moment ago had hung limp, now stiffened with the whirl of rotor force to a firmness that would withstand a hundred horse power. Centrifugal force did it! When the whir of its blades gathered power, the thing rose—not with a glide, or a slanting run to take the air, not at all—it rose straight up.

"Beautiful, beautiful!" shouted Colonel Wiljohn, his face tensing with excitement. "I did not believe she could do it!"

Now the little plane was coming down. A mechanism cut the motor dead. The thing stopped in its "tracks," so to speak, began to drift down in a perfect vertical, the gentle whir of the rotor blades holding the body balanced to every air-bump or current of wind that tended to shift the axis.

"You've got it all there, boy—goes straight up, comes straight down, it's a wonder—" Colonel Wiljohn's excited voice croaked to a dismayed gasp.

She was coming down—but in pieces. So great was the power of the gyroscopic whirl that the wings of the plane beneath them broke asunder under the force of the air streams hurled down. The whole little model crashed downward in a wrecked mass.

Week after week, Hal Dane pursued his patient experimenting. He tried two rotors, one above the other and traveling in opposite directions, with the idea of equalizing balance to the nth degree. It did not work; it only complicated matters more. He made shorter, the already short, fixed under-wings, and tipped up their ends. Still the strain was unrelieved, still the mechanism tore to pieces under that whirling force. At last Hal got at the root of the matter—it was too much power hurled down by the gyroscope. By degrees, he learned to decrease the size of the air slots in the gyroscopic instruments, learned to shoot the air stream in a more gradual manner until he achieved just the amount to power the controls, and yet not break them.

When Colonel Wiljohn watched Hal's final model make its beautiful straight ascent, and settle down with an equally beautiful vertical descent, this veteran of aviation manufacturing stood long, gazing out with dreamy eyes. Finally he turned. "Hal Dane," he said, "I've been seeing a dream picture in the sky; it's the dream city all our artists have been painting ever since the Wrights flew their first plane off Kill Devil Hill. In this pictured city-to-be, airplane terminals are built right upon the roofs of high down-town buildings; every

little home has its private landing field upon its own rooftop; big planes, little planes swoop straight up without ever a wasted acre of runway. Until this minute, we have never been an inch nearer that marvelous goal than we were twenty-seven years ago. Suddenly you open up a new world in aviation. Come over to the office and let's talk business."

Behind his familiar desk with its papers strewn comfortably to hand, Colonel Wiljohn took up the conversation again.

"This gyroscope idea is all your own, you have worked it out well in model. To put it into a practical, working-sized plane will take money. In fact you will need a great deal of money—which you haven't got. To a degree, I am a man of wealth. But at present, my factories need a stirring advertising campaign, something to turn the eyes of the world towards us. The Bojer Works, and others that turn out planes inferior to ours, are by their daring advertisements deflecting part of our natural business to themselves." The Colonel's hands crumpled some papers in a tense grasp. He paused a moment, as though to get a grip on himself, then went on. "For our plant to build the plane that wins the great Onheim Prize—ah, that would be unexcelled advertising for us! We will put up the money

and the factory experience to build your model into its completed practical form. You will fly it and win the prize. Your model must win —it's the biggest idea born in the last twenty years! The Onheim twenty-five thousand dollars will be yours! The right to build planes after your model will be ours, but with a per cent of the profits coming to you. Do you agree?"

"I—yes—no—" Hal Dane was struggling with eagerness and hesitation. "You are more than generous in your offer. Build the gyroscope plane and I will fly it for you in the Onheim Contest—fly it to win for you. But the Onheim Prize is not what I want—I, oh,—this is what I want—" Hal pulled from his inner pocket a ragged clipping. The newspaper date that headed it was three years old. "This is what I want to win, the Vallant Prize for the first non-stop flight across the Pacific—"

"That," Colonel Wiljohn rose to his feet, his face hardening, "that offer ought to be forced into a recall by the government of this country. It is a feat, not only impractical, but impossible of accomplishment. Already the Vallant twenty-five thousand has lured a number of our best flyers to their deaths. There was young Orr, and Jim Hancock, and—"

"It was lack of preparation that killed those flyers." Hal was on his feet, too, defending his most cherished plan, his dream of a great Western flight. "They tried to do it in a mere average land plane, over-weighted with non-essentials, not enough space for extra fuel and the like. They hadn't planned and dreamed an ocean-flight plane for years and years. Wait, just a moment—" and Hal Dane slipped out of the office.

When he came back, breathless from running, he bore in his hands the little model of the long-winged silver ship that had hung in his room where he could lay eyes on it the minute he opened his door.

"This is something like what I'd need." He laid the model in Colonel Wiljohn's hands. "Body cut down to its slenderest, a greater stretch of wing for speed, but part of the wing interior could be used for storage purposes to carry emergency rations, a still to condense water, extra fuel. I've got a lighter engine in mind too, and higher-powered fuel than any of the rest used."

For the better part of the night, Hal Dane and Colonel Wiljohn clashed verbal swords over the boy's proposed ocean flight.

No matter how well prepared for, it was a wild undertaking. The Colonel pleaded for

this young flyer whom he had come to love as his own kin to stay on in America, to put his talents to work for aviation safety, not for aviation madness of ocean flights.

But the call of the winds was in Hal Dane's blood. Even as his ancestors in frail boats rode the currents of the sea to seek a far continent, so was the Norse blood in his veins urging him on to ride the rivers of the wind on some far exploration.

In the end, Colonel Wiljohn gave down before Hal Dane's adamant decision.

"Boy," he said, "you win! Fly the safety model for me at the Onheim Contest, and I'll build you the finest plane ever sent out on an ocean flight—but I fear that ocean flight like death."

CHAPTER XVI

ABOVE THE CLOUDS

"Boy, you can say 'Excuse my clouds!' when you ride that thing, eh?" John Weldon, master mechanic at the Wiljohn Works, stepped back to gaze at the strange-looking, long-winged monoplane that was under construction.

"And I hope I can say 'Excuse my fog!' too." Hal Dane lovingly touched the aeronautical board of the plane whereon were featured the newest devices to safeguard fog flying.

In the place of trusting to any natural horizon that snow and thick weather all too easily obliterate, there was set in Hal Dane's ship an "artificial horizon." This was not so immense as it might sound, but was merely a small instrument that indicated longitudinal and lateral position with relation to the ground at all times. Another innovation was the sensitive barometric altimeter so delicate as to meas-

ure the altitude of the airplane within a few feet of the ground.

The above instruments were to stabilize the plane, to keep it to an even keel in flight mostly. Now came an instrument to help at landing—the visual radio receiver. This consisted of two little vibrating reeds tuned to the radio beacons in use in landing fields. If, in aiming at a landing, Hal turned to the right of his course, the right reed vibrated, while at too much of a left turn, the left reed registered its little movement. So by keeping the two reeds in a balancing quiver, he could fly directly down the path of the beacon to a landing.

True to his promise, Colonel Wiljohn spared no expense in building Hal Dane the finest sky boat that ever flew above land or water. Because the splendid Wind Bird was built for speed, every surplus inch was pared off—and yet because of the dangers she must face, every known safety device was also built into her.

Compared to existing types, the Wind Bird had streamline qualities of an arrow, of a needle! Instead of the old complicated gasoline engine with its exposure of wide air-cooled flanges butt-heading against the wind, the new Conqueror-Eisel engine was a marvel

of compactness, and of simplicity. This oil-consuming Eisel engine was fundamentally more reliable than the old gasoline engines, for it was without batteries, and was thus not dependent upon either an intricate electric ignition system, or upon a carburetor system for fuel supply. Separate fuel-injection into each cylinder assured a dependable and uniform supply of fuel—thus constituting in a nine-cylinder, nine individually operated motors in one. And of greatest importance for a vast trans-ocean flight, this new engine could fly a ship one-fourth as far again on the same weight of fuel as any other engine had ever been able to achieve. With an Eisel engine, the great Lindbergh could have flown to Paris, and then have flown eight hundred miles farther—all on the same fuel supply!

Fuel supply can mean life or death in the perils of ocean flight. On his ocean flight, Hal Dane was going to attempt to fly farther than man had ever flown before.

By experimentation, Hal Dane and Colonel Wiljohn tried to figure out and face every danger that the boy could be subjected to on his great flight. They were planning for success, but no explorer can afford to blind himself to possible danger—fog, storm, wreck on the limitless waste of the ocean.

Against that dire chance of being forced down upon the water, the Wind Bird was outfitted with a dump valve that could drop the bulk of the fuel load in fifty seconds. Another protection in case of a wreck on the ocean was a steel saw that would enable Hal to hack off the motors and the steel fuselage, and thus turn the wing into a raft. Within the wing was a compartment to store emergency rations, a still to condense water, a water-tight radio transmitter. Four gas balloons were to be carried to lift the aerial of this transmitter.

Time and again the model of the Wind Bird was sent up with loads greater than ever the real Wind Bird would have to carry on the Pacific flight. During these load tests, Hal found that he would have to redesign the rudder, strengthen the fuselage, fit the plane with stronger axles and wheels.

This was a time of proving and verifying all manner of mechanisms. Continually, the principal features of both the Wind Bird monoplane and the strange rotor-bladed gyroscope were given try-outs on dog planes, as the test planes were dubbed. And continually, "bugs" developed on both types of models. "Bugs" are what the aero-mechanics call those errors that always show up when air-minded

inventors begin putting theory into practice. The air is still such an unknown quantity that when mankind tries to enlarge an air machine from a tiny model into a great forty-foot wing expanse, a hundred odds and ends of air troubles immediately develop. This has always been the case. Back in those early experimental days at Kitty Hawk and at Kill Devil Hill, the Wright brothers had to fight the error "bugs" that crept into the enlargement of their models. Those early Wright gliders that flew perfectly in models scaled to inches, proved whole-hearted flops when enlarged to man-sized models. By painful, slow degrees, the Wrights finally mastered the fact that in enlarging a heavier-than-air flying machine, one part can be enlarged to four times its size, while another part of the same model may have to be enlarged sixteen times in order to preserve the air balance.

Hal Dane had the hard-earned knowledge of the Wrights, and of a hundred other inventors to help guide him to air truths. Yet, for all that, his planes were both so radically new in type that "bugs" all their own had developed and had to be patiently weeded out. But ambition drove young Dane harder than any whips could have driven him. There were periods when he bent over his drafting table

thirty-six hours at a stretch. The personnel of the Wiljohn Airlines caught the spirit of his vast ambition, and during months of construction, the organization labored as it never had before. Day and night, seven days a week, the work went forward. Out of cloth, wood, and a few lengths of steel tubing grew two structures that differed enormously. The gyroscope idea was developing into a squat, square-looking, heavy-set plane; while the Wind Bird with its streamlined body and vast wing stretch seemed to spell speed, speed!

In periods when he was not needed for drafting or supervision work, Hal Dane slipped away aboard an old plane on some mysterious journeyings. If the facts were known, however, one of those journeys was not so mysterious after all, merely a boy dashing home to see his mother before he undertook a dangerous ocean flight. His other secret missions were flights up and down the Pacific coast where he was trying for the altitude that would best speed him off into the great western river of the winds. From the data that he gathered, the boy made for himself strange, wavy-lined maps and charts of the airways. In addition to these, and based on nautical tables and on gnomonic and Mercator's charts, he plotted out a great oceanic

circle course that was to lead him northwest from San Francisco, up towards the Aleutian Islands, on across the Pacific, and in a final southwest dip along the Asian coast until he brought the Wind Bird down in Tokio, capital city of Japan.

Work so engrossed Hal Dane that the time seemed to slip away before he knew it. Here it was April. A few more weeks would usher in May and the great Onheim Safety Device Contest. Hal was more than anxious to get the Onheim Contest behind him. For after he had flown the gyroscope in that test, he would feel that he had fulfilled his obligation to his staunch friend, Colonel Wiljohn,—would feel free to undertake his heart's dream, the Pacific flight.

Clutching at Hal Dane's heart was the black fear that some other aviator would beat him to that conquest of the Pacific in the great non-stop flight.

Mr. Vallant's recent offer of an additional ten thousand dollars was stirring vast interest in the Pacific Ocean flight. Flyers everywhere were awakening to the fact that they had let the huge Vallant Prize go unclaimed long enough. From across the Pacific, word came that Sugeroto, that small, lithe Japanese aeronaut of princely birth, was warming up a

plane for the flight. Two American aces in a great trimotor were testing out their plane with the same prize in view. Some ten other aviators were also reported as planning to get in the Cross-the-Pacific flight.

From his latest expedition into the airways above the western coast, Hal returned with jubilation in his heart. Even in the old model test plane he had taken out, he had ridden far and fast on a swift and mighty wind river high above the California sea edge. Young Dane was wild to be off in his own wide-winged speed plane, skimming this airpath on his viking journey across the western ocean before so much multiple competition achieved the goal ahead of him.

But back at Axion, at the Wiljohn factories, Hal Dane, instead of coming to his Wind Bird completed for its try-out, found work everywhere disorganized. The two near-finished planes that he had expected to test in two such different flights, were left perched on their skids with no hands patiently, carefully building them on to their perfection.

Over radio had been flashed the news that the whole Three-River district of south Alabama was under water, that hundreds of square miles of territory were swept by raging floods.

And Jacky Wiljohn, gone south with his mother for the winter and early spring at a resort, was in that flood country.

The danger to his beloved idol swept away from Colonel Wiljohn's mind every plan for air-conquest and glory of prize-winning air models.

To Colonel Bob Wiljohn, aviators now had but one reason for existence—aviators could act as eyes for the vast rescue army that was fighting the floods. Aviators could fly over the torrents to search out the men, women and children clinging to such land heights not yet reached by the floods! Aviators could rescue families huddled on their home roofs that tumbled and tossed in the muddy currents!

The pick of planes and men from the Wiljohn Works went south for the rescue work.

When Wiljohn's star pilot, Hal Dane, read the screaming black headlines of the disaster and the call for help, he answered that call by pushing glory dreams out of his mind and going down into that flood country too. The ship Hal went south in was the dog plane test model of the gyroscope. That rotor-bladed, squat-built contraption was going to get its proving in a real emergency.

CHAPTER XVII

FIGHTING THE TORRENT

To make the trip from Axion down into the flood-tortured southland without any further loss of time, Hal Dane set out to fly all night. He had already signed up with the Red Cross department in his own city, and had gotten his instructions. He was to report to Major Huntley, in charge of the Alabama flooded district, who would assign him his work.

The squat gyroscope had been planned for safety, rather than making mileage records. Yet when those limber, awkward-looking rotor blades began to reach their maximum of two thousand whirls a minute, why, the strange craft achieved a speed of near a hundred miles an hour!

Late afternoon had been hazy, with the sun going down an ominous ball of red. Now as the night wore on, Hal swept into heavy weather. Mist changed into a dense, clinging fog. The wind rolled up into a gale that

seemed to strike from all sides at once. For safety's sake, Hal rode high, at something like ten thousand feet. He had the feeling of a lone human survivor drifting above a fog-shrouded world. He must have passed over hamlets and cities innumerable, yet no glow of home or street lights penetrated upward through the fog blanket to point him a guiding beacon.

Hal's training in blind-flying stood him in good stead here, for relying on his marvelous earth inductor compass and his instrument of artificial horizon, he managed to keep an even keel. He held a wary eye to the altimeter, however, for come fog or come wind, safety demanded that he ride at a vast height to avoid a death-dealing crash against some jutting mountain crag. Three times, the multiple raging of the gale engendered by the tempest swinging upward through the gorges, told Hal that he was crossing mountain ranges.

On through the night the aviator drove his strange rotor, dodging, twisting, tacking, riding down the wind gusts. Then towards morning nature seemed to soften and grow milder. The wind sank to a breeze. Stars came out just before the darkness lifted for the first pale pearl-gray of dawn. A rose glow spread till the whole horizon seemed aflame.

It was glorious here, high above the earth, but as Hal turned his eyes downward a dreadful view met his eyes. Dismay shot through him.

Had his famous compass failed him? Had winds driven him far off his track? Had he crossed the whole length of Alabama and the top of Florida to go drifting like a derelict above the Gulf of Mexico?

There was a sea of water below, a limitless, shoreless stretch. But instead of white-capped waves and the clear blueness of the tropical waters of the gulf, here lay a muddy, ochre-colored ocean.

Then the horrible truth swept over Hal Dane. He was flying the flood! These ugly waters covered no natural sea bed, but swirled sullenly above the homes, the villages, the cities of the southern section of a whole state.

All landmarks had been blotted out, but the aviator got his bearings by compass, and studied the map he drew from his pocket. This must be it, the country drained in normal times by the three rivers, the Conecuh, the Pea and the Choctawhatchee. But now the waters followed no separate river beds down to the sea. Instead they had burst all bounds and covered the face of the land.

He drifted down until he hovered at only a

hundred feet of altitude. From this height he could clearly vision the astounding panorama of watery waste.

Spires of churches and here and there taller buildings in a group showing partly above water told that here lay some town. Straight lanes of water between the tops of forest trees meant that beneath the flood a highway ran. Borne on the yellow tide of the foul, swirling sea were the dead and swollen bodies of mules, hogs, horses and cows. Mingling with these were houses swept from their foundations and drifting with the current.

At intervals, he would catch sight of some hill or some turtle-backed Indian mound on whose crest was huddled a village of tents—frail shelters for the refugees fleeing from the wild onrush of the flood.

Was Jacky Wiljohn found and safe within one of those tents, or was the little fellow still out on some half-flooded land ridge or marooned in some drifting building?

Now that he had come and seen for himself, Hal Dane realized for the first time the awful magnitude of this peace-time tragedy. Here was a disaster that equaled pestilence and battle in its devastation. He had read of these things—but seeing them was different, more awful.

Fog and storm had drifted Hal somewhat off his course. He consulted his compass, took his bearings again, and decided that he must be to the west of Troja, the hill city on the edge of the flood where were situated the Red Cross headquarters.

He whirled the nose of his plane into the east. A little later he caught sight of what he knew must be his destination. Below him lay a little city whose outskirts were lapped by the sullen yellow waters. Up in the heights a whole new city section had been developed with its streets lined by rows of little army tents. Some seaplanes lay at rest in a sheltered bay of flood water. Out on a stretch of meadow army planes were roped to stakes, tails to the wind.

Hal circled about the field a few times until he could pick a good landing spot. Then he cut his motor dead and began to drop. With outspread rotor blades acting like a parachute, the curious sky boat with its short stiff side wings, drifted straightly, gently down towards earth.

By the time Hal settled to his landing, he was surrounded by a ring of civilians and soldiers with a sprinkling of keen-eyed, suntanned fellows that he felt were likely aviators. Some of the crowd guffawed loudly over

the squat, awkward look of the old hen as they immediately dubbed the odd, square-built machine. The majority of the men, though, applauded the unusual feat of the straight-down drop.

A heavy-set, haggard-eyed man in uniform, who appeared to be the one in authority here, stepped out and extended a hand in greeting.

Hal returned the warm grasp. "You, sir, I'm sure must be the Major Huntley I was to report to."

"Yes, and you," the fatigue lines on the officer's face were momentarily lifted by a whimsical smile, "you must be the Hal Dane our man up in Axion wired us about last night. His message read, 'Fellow with the most curious-looking plane in the world coming down to help you!' "

"That just about describes us," said Hal with a grin, as he cocked his eye over toward the old hen.

"Well, Hal Dane, Camp Number One welcomes you and your help. That's a strange contraption you've brought down though. We've had about everything else sent in to help us—coast guard cutters, steamboats, flatboats, army planes, navy planes—but never any such sky boat as that—something new on me—"

"Something new on everybody," said Hal, "but if it works like we hope, it may be a help in getting folks out of tight places."

"From all accounts, you flew the whole night through. Come on up to officers' quarters for breakfast and some rest." Major Huntley led out in the direction of a row of tents.

"I'll take the breakfast—the sleep can wait," Hal stretched his long legs to the Major's brisk stride. "Reckon I'm a good bit fresher than you folks that have been in this thing from the beginning."

"Oh, we've all gotten flood-toughened. There are fellows here that haven't had their clothes off in six nights." Huntley had piloted Hal to a bench before a long, rough trencher-board table. While the hot, nourishing soup, bread and coffee were being ladled out, the Major went on. "Since you're willing to keep on working for the day, we're too short-handed not to accept your help."

Hal found the men of the officers' mess a fine, capable lot of fellows, even if they were haggard from overwork and their uniforms all yellow stained and mud caked. Grim days, grimmer nights of toiling in flood and muck left no time for dress parade formalities.

At his first chance, in a voice out of which

he couldn't force the tremble, Hal asked after Colonel Wiljohn. Was he here? The little Jacky Wiljohn, had he been found yet?

Yes, the Colonel was here, a fine old fellow, doing great work with his crew of aviators. Too bad about the boy, though! Not a sign of him and the mother had ever been found. The big hotel at Malden, just below the forks of Pea River and the Choctawhatchee was flooded now, but it had been deserted for days, everybody had been gotten out in boats early in the flood. That young Mrs. Wiljohn and the boy had gone off in a canoe, picnicking, it seemed, up some little creek the day the floods had begun to rise. They'd never been heard of since. Which was something of a mystery, considering the number of boats and planes that had combed all sections in a special hunt for these two.

CHAPTER XVIII

TO THE RESCUE

"Since you are one of the Wiljohn men," said Huntley, "I'll turn you over to the Colonel for further directions. He's handling our aviation fleet with a master hand."

When Hal came face to face with his friend farther down the street of the City of Tents, he was shocked to see how broken and feeble Colonel Wiljohn had become. In six days he had aged a score of years.

"Hal, Hal—we've needed you."

"I came as soon as I heard, sir."

"Might have known you would." Hal could feel the tremble of the Colonel's arm as it lay across his shoulder. Then the tremble steadied, and the Colonel went on in a firm voice, "Well, we've work a-plenty for you to do. I'll be showing you the ropes."

It was a marvelous organization that Hal Dane slipped into. He became a cog in a huge, efficient machine.

Over night almost, this flood had come.

Over night, also, America organized to save the people in the flood path.

When this appalling disaster broke, the American Red Cross moved swiftly. At Troja, Alabama, was set up a special Flood Relief Headquarters. Here quickly came the key men of the Red Cross staff from all neighboring states. To work in liaison, there came also officers of the Army, Navy, Public Health Service, Coast Guard, Department of Agriculture, Veterans' Bureau and the railroads which served the flooded area. It was an effective relief force, equal to any war-time organization.

It was a war these men were fighting—a war against a treacherous, rolling, yellow flood.

From all over the Union came shipments of food, clothing, tents, medicine. There were garments to fit any size refugee, from an infant on up. There were specially prepared tin cases of food, all ready to be dropped down by airplane to hill-top refugees, or those marooned on drifting houses, so as to keep life in their bodies till boats could haul them off to safety.

Hal was surprised to see in the midst of a supply train standing out in the railroad yard,

a long box car bearing in big letters this striking sign: "Extra Airplane Parts. Rush to Three-River Flood District."

"The airplane is showing the world what it can do in times of trouble," said Colonel Wiljohn, noticing Hal's excited gaze upon the portable aircraft shop on the side track. "Aviators are the eyes of the Rescue Program, boy; scout planes fly this blasted flood day and night, reporting refugees, their exact location, and the best way to reach them. See, here come some results now." He motioned out towards the water.

A square-nosed old river steamer was pushing in before her a barge loaded with the pitiful, shabby furnishings of many a humble plantation tenant home. Over bundles of bedding, the dogs and children crawled; amid piles of rickety furniture, tin tubs and hastily gathered utensils and tools, the family mules and cows were tethered. On the decks of the steamer, itself, huddled half a hundred cold, wet, hungry refugees. The boat was a weather-beaten old side-wheeler, clumsy and creaking. But to those refugees, just snatched from the jaws of death, she probably seemed the finest ship afloat.

Planes came in, other planes took off—an endless chain of scouts.

Hal was aching to be out on the work.

"Aviators have to be the ears as well as the eyes in this flood fighting," went on Colonel Wiljohn, "I'm expecting great things of even this dog plane you've brought down, but we've got to get radio equipment installed on it before you take it out on the job. Radio is our time-saver. You can wireless a message in one-twentieth of the time it would take you to zoom back and forth delivering reports by word of mouth. There's an extra seaplane here, already radio-equipped. You can take that out."

"Any kind will do," said Hal, "just let me get my hands on the stick and be off."

"I'm changing one group of men to another section," went on Colonel Wiljohn, "and the work I want you to do today is scout-flying in a ten-mile radius over the flood country below the forks of the Pea River and the Choctawhatchee. You'll have to locate the forks by chart, that section's been under water a week. And Hal, search every creek that leads in—I—I'm depending on you more than any of the others—to find—" The Colonel turned away suddenly.

Hal felt a quick sting behind his eyelids. He choked till he could hardly give his answer. Without having actually said so, the Colonel,

he knew, was giving him the patrol of the district Jacky was lost in. If only he could find Jacky!

A few moments later, Hal had become one of the many aviators whose planes circled over the heaving waste of flood waters. At low altitude roared these scout planes. Keen-eyed as hawks, the flying men sought continually for groups marooned on ridges or housetops. In answer to their radio messages flung into the ether, the rescue steamers churned far and wide across the yellow tide, hauling bargeloads of silent, stupefied people snatched from their perilous retreats. As the work went on, most of the hill-top islands were cleared of their refugees, but out of creeks and bayous, shackly old buildings swept from their foundations, and burdened with pitiable human freight, continued to drift down with the flood current. Scout planes flew low over these floating derelicts. It would be haggard faces at a window, or a scream; or, sometimes it would be a quavery old voice singing a hymn that told rescuers that here was human freight drifting down to death.

At the beginning of the flood, each drifting house was, mayhap, searched a dozen times by various boat crews—no crew knowing that already others had been there before them.

Time was lost that could have been put to other needs. To avoid this, it was finally agreed that when a house was once searched a red flag, made of calico salvaged from a half-submerged dry goods store, should be nailed to its gable.

Hal saw some pitiful sights during his day's work. Up Jardin Bayou he found five negroes on the roof of a tottering barn, the building ready to collapse and float off. When Hal dropped them bread from the emergency box in his cockpit, they hardly had strength to hold it and eat it. They had been without food for days, and were so weak that when the rescue boat came they had to be lifted off into it.

Some of the refugees that Hal radioed word back about were the four-footed kind. All through the flooded district, hundreds of mules and cattle were marooned on ridges and mounds. These hungry ones soon cleaned their tiny islands of every vestige of grass, moss and twigs. After that, they looked starvation in the face. Hal saw one hungry old horse, marooned on a bare little mound, who had the courage to plunge into the roaring flood, swim a hundred yards to a leafy tree that lifted its head above the yellow torrent, eat what waving green he could from it, then go struggling back to his mound. Such a

courageous one deserved to be rescued. A radio message brought a barge to gather him up with a herd of other animals stranded on a ridge farther up.

Midday came and passed. The hours wore on into the afternoon. The night of flying across half a continent, combined with the strain of the work he was at now, began to tell on Hal's strength. His head was whirling and his aching muscles were in rebellion against the will that drove them on.

Then in an instant, a glimpse of a something lodged in the branches of a drifting tree spurred him on to fresh endeavors, cleared his brain of fatigue clouds. Hal was miles from headquarters, skimming above a section which had been cleared of refugees earlier in the day. And now into his line of vision there came drifting a tree, now and again submerging to the pull of the currents, and bearing caught in its branches a tiny figure.

Mechanically, his fingers tapped out location and a call for help. Then Hal began to maneuver his seaplane for a landing in these troubled waters. Assistance he knew would come quickly, but perhaps not quick enough in this case. If the plunging tree raft with its lone little passenger was swept into the eddies just beyond it would be the end.

Hal brought his plane to water as close to the forest derelict as he dared. He stood, braced himself strongly, and hurled a coil of rope. It hissed through the air and fell over the leafy drift. At the first throw he caught only some twigs that the rope knotted about and he had to jerk it free. The next cast, however, fell over the body of the child, and by expert jockeying was finally tightened about the shoulders. A moment later Hal had drawn the slight burden to the edge of the seaplane and gotten it aboard. Like a great bird the aircraft zoomed up and sped back towards camp.

As Hal landed and came up from the improvised wharf bearing the child in his arms, it was pitiful to watch hope blaze in Colonel Wiljohn's eyes—then as quickly die, for the child was not Jacky Wiljohn.

But he was someone's darling. At the end of a long line of refugees waiting before the open-air kitchen for their tin pannikins to be filled with the steaming food, stood a haggard woman who seemed to have no interest in food or anything else. With a sudden scream, this one darted out of line, crying, "Renee! Renee! My lost child!" as she gathered the little boy into her arms.

It was far into the afternoon when Hal

paused at the kitchen grounds for a hasty lunch, his first bite since the morning soup. He began to realize how weary he was, for his hand was trembling as he picked up the big mug of steaming coffee.

Radio kept even a rescue camp in touch with world news. As Hal revived his drooping spirits with a good, thick hot beef sandwich, he heard men discussing word that had just come in concerning the two flyers, Lang and Munger, who had crossed the continent in their planes, preparatory to undertaking the great Pacific non-stop flight. On all sides, argument waxed hot over this coming event. Wasn't there enough land-flying to keep men busy without all this running into needless danger trying to fly over the frozen poles and the oceans? And yet, so ran the other side of the argument, think of the future of aviation, the real service these pioneer flights were doing, the huge money prizes, the glory!

After the meal, the flyers that had been out on flood patrol were snatching a little rest.

A dreadful restlessness urged Hal Dane back into his scout plane. A new savage energy drove him with the feeling that he must work till he dropped. He must be too tired to think. Thoughts were dangerous. The news that already at Oakland airport, across

the bay from San Francisco, planes were lining up to compete in the Pacific race, stirred him terribly, shook the iron control that he had fought to preserve.

As soon as weather conditions permitted, a dozen planes would be off on the great flight—and his plane would not be among them!

The time for the splendid Onheim Safety Device Contest was looming even nearer. Just a few days to that date now.

Prizes could come and prizes could go, but under the strain of combing the torrent-washed land for the lost Jacky Wiljohn, neither Hal nor the Colonel could have time for thoughts of contests. At least, Hal would not let his thoughts dwell on the great chance he'd have to miss. Right now was a time of testing out a character, if not of testing out a ship for a prize.

Grimly, Hal forced the tremble out of his hands on the controls, and turned the nose of his plane out over the rolling ochre-colored waste of flood waters.

He had come perhaps ten miles from Troja when, out of the wide, flooding mouth of a tributary creek, he saw a roof top come drifting into the main rush of the torrent. Hal flew low, noting it expectantly—any drift from the creek bottoms might contain those

he sought. His sharp eyes soon showed him, though, that this derelict had already been searched. The strip of weather-stained red calico nailed to the gable told him that much. But while he still hovered near with engine muffled to its softest, his ear seemed to catch a scream—a woman's scream from within the drifting house.

The flapping bit of red calico signaled, "No occupant—searchers have been here."

That one long-drawn wail still echoing in Hal's brain, though, must mean that some victim of the flood was housed within. There was the chance that a refugee from floating logs, or a tree top, had but lately managed to crawl aboard the half-submerged dwelling.

Hal noted well the location and the type of house this drifter was, but instead of radioing for help, he shot back to Troja in his plane. At the camp, he sought out Colonel Wiljohn and told him of the case. All he had to go on was the fact that this old dwelling had drifted in from the creek bottoms, and that the sound of a woman's scream had seemed to come from it. Frail grounds for hoping that here might be Jacky Wiljohn's mother and the boy himself. But Colonel Wiljohn squared back his shoulders; he became all fire and energy in his preparations. A launch was got ready, blan-

kets, hot soup in thermos bottles, axes to break any barriers, ropes.

In short order the boat shot out across the waters, leaving a froth of yellow foam in its wake.

When the drifting, two-story dwelling was sighted, the pilot cut in close and maneuvered until he got his craft alongside one of the windows.

Hal was the first man to scramble from the boat to the window ledge that was now just a few inches above the roaring yellow torrent. As he flung a leg over the sill and slid down into the room, a scream, like that first he had heard, greeted him—only terrifically loud, a wild demoniac scream, followed by a coughing, snarling roar.

As Hal focused the electric torch on the corner whence came the sound, the beam blazed upon the wide-set eyes, the tense, crouched body of a great panther.

CHAPTER XIX

WHEN LAND CRUMBLED

For a moment Hal Dane's heart seemed to cease beating.

The huge panther was the largest of its kind he had ever seen. In his scouting above the flood country, he had now and again glimpsed a few of these great tawny creatures of the cat tribe that the waters had driven from their forest haunts. Out in the open these others had merely slunk off, hiding from even the shadow of the airplane that passed over them.

But cornered, the panther was a different beast. He was ferocious, and fought to kill.

This one, sides sunken with hunger, flat ugly head weaving back and forth, jaws snarling open, crouched tense in its corner.

A sudden ague shook Hal's hand till the spotlight wavered up and down the walls. The next instant he controlled himself, held the torch glow again on the beast before him. In the space of that instant, the panther had

glided out from his corner. The light flung into his fiery eyes sent him motionless again —but how long would the spell-binding of the torchlight last?

Hal Dane moistened dry lips, shaped his mouth to whistle, and at last forced out a shrill sound. He had seen steady whistling charm small animals like rabbits and foxes into a momentary "freeze". He prayed that it would work now. Dry-mouthed or not, he must keep up this shrilling ten seconds, twenty seconds—till his hand could lift his revolver from its hip holster, till he could take aim.

It was a six-shooter, but he remembered, with a chilling to his very marrow, that there was only one shot left. He had used the other five picking off rattlesnakes that had seemed determined to move into the dry haunts of the human refugees.

A sudden switching of tail tip, a lower crouching of the powerful tawny body, told that the spring was imminent.

Steady! Because the head hung low, he must aim at the brain through the eye.

But before Hal's gun could belch forth its one shot, the great beast had leaped. Hal's hand flung up to new aim. In the ghastly white torchlight, a roaring tornado of teeth and claws rose above him.

The pistol shot its load straight up. And that instant, the boy flung himself backwards out of the window. Instead of landing in a waiting boat, he plunged into the cold, yellow depths of flood water.

He came up sputtering and choking. But after the first shock of his submersion, he felt no alarm. He was a strong swimmer and could keep afloat for hours if necessary. He bumped into what he thought was a drifting log, but it turned out to be a derelict canoe upside down. He clung to that and shouted. His electric torch and revolver had been lost as he leaped from the window, almost under the impact of the panther's downward slashing claws.

Hal's lusty shouting soon produced results. The rescue launch which had drifted down stream, put about and with its headlight spraying the water surface with its searching glare, nosed cautiously back up alongside of him and his float. Strong hands hauled him aboard and a warm blanket was flung around him.

Colonel Wiljohn was storming up and down the little craft in a rage at his crew for deserting Hal in his time of peril.

The fellow at the steering wheel was rather shamefaced over letting a gunshot and pan-

ther caterwauls shake his hand so that the boat shot from his control and into midstream.

"D-don't blame you," chattered Hal, drawing the blanket tighter about his dripping person, "if it s-s-sounded half as awful to you all outside as it did to me inside—it was t-t-time to be leaving!"

To make sure that the great panther was not left merely wounded to suffer lingeringly, or perhaps to injure someone else who might enter the place, the boat was drawn again within sight-range of the drifting old house. Lights were played over the upper story room, now so nearly submerged.

The long tawny form lay stretched on the floor, without sign of movement. Hal's one shot had done its work.

Hope died hard in Colonel Wiljohn's breast. His mind told him that the shrill "woman screams" that had lured Hal to this place could only have been the panther's call—so like a woman crying in distress. To satisfy himself, however, the Colonel searched every possible part of the floating, careening old house. With an axe he forced an entrance through the warped, swollen doors to the three upper rooms, searched closets and cupboards. He found no woman and child hiding away from that other passenger,—the great, tawny pan-

ther cat. A pitiful litter of clothes, books, a few small toys, deserted when the home-dwellers had to flee for their lives, was the only reward for his search.

Back at the camp, Hal experienced all the comforts of being a "refugee". Good dry clothes and a draught of hot milk took the shivers out of his bones. After his report was made out, he flung himself down in his tent to snatch a bit of sleep. With thirty-six hours of steady strain and flying behind him, slumber claimed him the instant he hit his bunk. But tired as he was, he had left word that he should be called early.

Next morning before the sun rose, he was out on the field warming up the motor to his strange gyroscope plane. He found the radio installed. Workmen from headquarters had done it while he used the seaplane the day before. Everything was in working order. He tested the instruments and found that they were of the best. A few taps and a message would go speeding through the air.

Even this early in the day, a small crowd gathered to watch the squat old hen, the new-fangled plane, make its rise. As the rotors stiffened with their power whirl and the thing took off, Hal heard a sound of cheering drift up to him faintly. For all its awkward look,

this thing did rise like a lark on the wing. He turned her nose out over the flood.

For the time being, Hal Dane wanted to follow out a clew entirely on his own. In the dusk of yesterday, as he clung to the drifting, upside-down canoe, and the lights from the launch had played over it, the name painted on the battered derelict had seemed to sear into his brain. The letters had been inverted and he had read them but subconsciously at first, then their meaning had suddenly seemed to burn into his brain in letters of fire. "M-a-l-d-e-n, Malden"—the name of the hotel where Mrs. Wiljohn and Jacky had stayed. This was a boat from that riverside resort. Malden was miles below where he and the drifting boat had collided yester evening. So that meant someone had gone up-river in the canoe and let it get away to come drifting back down. That someone could be the Wiljohns. What had happened to them? Were they alive after all this time? More likely, dead!

It was all too frail a clew to build any hopes on. Hal could not bear to mention it to Colonel Wiljohn. He had suffered too much already, to have another castle of hope built up, only to have it crash into bitter disappointment.

Young Dane flew his craft southward with the flood to a location he had noted the day

before, marked by a gnarled oak on a ridge lifting its battered branches slightly above the torrent. It was near here that he had first sighted the house of the panther screams. This big piece of drift and the derelict canoe must have entered the main flood out of the mouth of Tanabee Creek—or what had once been Tanabee Creek. That humble stream was now a mile-wide torrent, filling a valley. The overflow from the burst dam at Nelgat Lake had swamped this broad level.

Here the devastation had been terrible. As Hal pushed farther in this direction than he had been before, he constantly came upon sights that taxed his every sympathy. Many times he saw the bodies of men, women and children floating with the current. With a sinking heart, he swept low over those sightless faces turned toward the sky—searching, searching, but he had not found them yet. Numberless dead animals drifted down with the flood. Shattered homes rocked to and fro on the pull of currents, followed often by a welter of broken furniture,—chairs, a baby carriage, a cupboard that had once held dear family possessions.

Deeper into this desolation he pressed. About him everywhere, life seemed to have been smothered out under the waters.

He had been flying slowly, searchingly, for more than an hour, when his hawklike gaze focused upon a tiny rim of land, a crescent-shaped island barely showing above the torrent. The force of currents was eating steadily at the thin line of land. As Hal watched, a portion crumbled and toppled into the flood.

And then as he swooped down nearer, he saw to his horror that there was a human figure on that slender stretch of ground. He dropped closer, closer, the spread wings of the rotor above his machine letting him down as gently as though he hung in a great parachute. He dropped to a mere forty feet above the flood, to thirty. He could see a white dress, a woman's long hair flung out on the ground. She was apparently dead.

With every moment the rim of land was submerging. Soon the ravening yellow torrent would sweep over the last vestige. It seemed utter folly to risk a life and a plane for one already dead. Still there might be a flickering spark of vitality in that still body.

No use to tap radio messages for help. No help beyond himself could reach this doomed spot in time.

He must land on this narrow bit of earth already crumbling from the wash of the waves.

Under its strange whirl of wings, the gyroscope plane dropped straight as a plummet. A deviation to the right or to the left, and aircraft, aviator and all would have been engulfed in a roaring torrent without one chance in a thousand of escape.

But his trained eye had measured distances carefully. In that straight drop he landed well in the middle of the tiny land crescent, and where it was least narrow.

In the drawing of a breath, he was out of the cockpit and running toward the prostrate figure. Even at the thump of the machine to earth, that one had not stirred. But now, out from under a shelter of brush a child came creeping, a little boy that even this much effort seemed to exhaust, for he slumped down weakly.

It was Jacky Wiljohn!

"Jacky! Jacky!" shouted Hal Dane, "run for the plane, quick, while I bring your mother!" As he spoke, he could feel the rim of land trembling beneath him, crumbling to the awful power of the waters.

But the child lay where he had dropped. It was as though his last faint store of energy had been used in his effort to creep into the open.

Hal had already lifted the woman across

his shoulder where she hung limp. He was staggering under this burden, yet he must add more. With a quick swoop, he seized one of the child's hands and dragging him, took a few swaying steps forward.

Ten paces, twelve paces! Would he ever make it?

He sagged against the cockpit, slid the woman in; with another motion he swept the child in beside her.

Like mad, he spun the motor and leaped for the fuselage as the great horizontal wings began their first slow whirl.

Before him a whole end of the narrow island broke off and the flood foamed and roared across the place where land had been a moment ago.

Behind, there was a crash and sound of the torrent pouring over. Hal could not turn to look, but he knew what was happening. Earth toppling into the flood!

Would those four rotor blades above him ever stiffen with enough lifting power for flight?

Within ten feet of the gyroscope's nose water poured over the crumbled land edge. No room for even the slightest run now. Those rotors must lift straight up with their extra burden—or it would mean the end.

Centrifugal force was whirling the limp flimsiness of the rotors into an engine of mighty lifting power. Flexible steel stiffened as it spun a thousand, two thousand whirls to the minute.

The gyroscope was rising, slowly, not straightly as it should. Wrong balance of its burden shifted the take-off climb from perpendicular to an angle.

But at that, it cleared land and rose up and up into the sky.

Hal Dane looked down. It had been a fearfully close thing. Below him was no island at all, merely a surging waste of waters where he had just been. The last of the land rim had crumbled.

Now that he was above it all, his heart beat to the zooming roar of his rotors.

Speed! Speed! He must wing it back before life force ebbed entirely from those limp bodies behind him. Already his tapping fingers had flung the message of his find into the ether.

CHAPTER XX

PRISONED WINGS

In the days that followed, Hal Dane plugged steadily on with his share of the rescue program, until at last the crest of the flood had passed and the waters began to recede.

After a late supper each night, he paid his regular visit to the field hospital to see how the Wiljohns, mother and child, were getting on.

Tonight, as he tapped on the board and canvas door, the nurse stepped out.

"Yes, the change for the better has come," she said, "for a while we thought it was a matter of hours before life would go. Both had marvelous reserve strength though, and they've rallied surprisingly—are out of danger now. But," and the nurse smiled, "it'll be a good while before they'll be ready for another such speed trip as you gave them. That was a wonderful rescue you made, Mr. Dane."

Hal squirmed uncomfortably. "Just came in the day's work. Anybody'd have done it—"

"Nonsense!" A heavy voice boomed in. "Nonsense, Hal Dane! I'll tell you for the tenth time you're the only man alive that could have handled that gyroscope, and done such a feat. Finest thing I ever heard of—finest, absolutely—" Colonel Wiljohn's boom choked suspiciously and he blew his nose vigorously.

The nurse slipped back into the canvas-walled barracks that housed her patients.

"And Hal," the Colonel had himself in control again, "Hal, boy, I want you to know that even in my first selfish grief, I didn't entirely forget your hopes and plans. Days ago I wired to my men at the Axion factories to speed the finishing work on your two planes, and to rush them to San Francisco. Our mechanics will have everything ready for the demonstration at the Onheim Contest, if you get there in time. And whether you tackle that Onheim Contest for me or not, isn't what really matters—the main thing is, you'll find your Wind Bird ready for you and your great flight."

Hal's head seemed to whirl in an ecstasy. He had suppressed his every longing till he became a being that snatched a few hours' sleep, scouted floods with tensed nerves as long as a shred of daylight lasted, and plunked

onto a cot for a minimum of rest. Now in the twinkling of an eye, the suppression was off.

With the speed he knew how to get out of a plane, he could be in Denver at mid-morning tomorrow, and on to San Francisco in the early hours of that night. After that he could sleep a round of the clock and still be in time for the Onheim trials.

Instead of going back in the gyroscope dog plane that he had brought down and put to such good use, Colonel Wiljohn turned over to him one of his speed monoplanes, the fastest thing that had come into the flood country.

For all of Hal's feverish haste to be off, delays of various kinds held him for several hours. The monoplane, which had seen considerable service, had to be fueled and groomed for the long diagonal across more than half the continent. Friends that he had made in these grueling times of day-and-night labor hunted him up to congratulate him on the work he had put over and to wish him God-speed for the future.

By the time Hal had stepped into the cockpit of the speed plane, it seemed that the whole population of Tent-City-on-the-Flood-Edge had turned out to do him honor.

Colonel Wiljohn wrung his hand fervently.

"Your coming down here has been of more worth to me than I can ever put into mere words," he said. "And I only wish I could be there when you start the great flight."

"I wish that, too," Hal reached a hand down to his friend.

The motor roared, the blocks were knocked away, and the plane whizzed across the field and soared into the night sky. The great shout of the crowd seemed to rise with it.

Hal's mood was as bright as the moonlit heavens he sailed across. A hundred miles! And still another hundred! He was speeding like some gigantic bird. His instruments marked a hundred and twenty miles an hour. He was fairly eating up space.

Before midnight he had crossed the Mississippi waters unwinding like a great ribbon below the lights of Vicksburg.

Then flying slowed down. A dense fog rolled up about him. The moon was smothered out above. Below him, disappeared the scattered lights that meant farm homes and the widespread glow of city illuminations. He was alone, shrouded in a gray, dripping world with only his instruments to guide him.

As for direction, he had little fear of going astray. He was well used to setting a course by his compass. The chief need was to hold

to altitude so as to clear the loftiest peak that might be in his path. In the heights he hoped to find a lessening of the mist, but the damp grayness was here as everywhere else on this night.

As Hal Dane felt his way on into the night, eyes glued to the instrument board, there burst into his senses a sudden roar zooming through the fog.

The roar grew nearer. Another plane was riding high in the fog, and coming toward him like a shot out of a shell.

Hal's first instinct was to rise higher to slip over and avoid collision. His hand was on the pressure, when a quick thought sped like lightning through his brain—to rise high, that was natural instinct, that was what the other flyer would do, of course. There'd be two riding high, straight to a head-on crash!

With a slip of wings, Hal began to drop. But his reasoning had played him wrong here. A sound rushing upon him told that the other flyer, disregarding instinct, had dived also.

Through a rent in the fog, Hal had a sudden awful glimpse of a dark, spreading mass riding him down. Like lightning, he shot to the left. In the other plane, another master hand veered the controls all that was humanly possible. Instead of crashing into a death grip,

these two mechanical birds of the night slid by each other with a mere scraping of wings.

For Hal Dane, though, that mere scrape was serious enough. At the shock of the other's passing blow, the whole monoplane trembled, and went limping on into the night with a bent wing that drooped dangerously.

After fifteen minutes of erratic flying, Hal had to take to ground. The fog had mercifully lifted somewhat. He coaxed the crippled plane on to the edge of a rosy glow that meant a town and landed on the outskirts of this.

Hal spent the rest of the night in trips back and forth from the town, in rousting out mechanics, hunting up tools and repair material, and in repairing the wing by lantern light.

At last he was able to glide up along the airways again. Instead of humming into Denver in mid-morning, as he had planned, it was deep into another night when he finally zoomed into the airport of that Colorado metropolis,—turned his plane over to competent mechanics, and stumbled for sleeping quarters.

Before dawn, he was under way again. This time luck was with him and he did the last thousand-mile lap of his journey in less than nine hours.

As it was, he arrived in San Francisco with-

out even an hour's space between him and the great Onheim Safety Device try-out. No time for any rest for himself, no time for any preliminary testing of the splendid new gyroscope plane fresh from the skids of the Wiljohn factory. All he could do was give a thorough ground inspection of every part of this strange mechanism of flight that he had conceived, and that the Wiljohn factories had developed with the utmost care. There it stood—short, fixed wings, sturdy, black-enameled body, a silvered whirl of gyroscope wings above the fuselage. The strangest looking creation for flight man had ever invented! Strange looking—yes! But if it worked, it would be man's most forward step in safe flying!

It was perfect, just as he had planned it, from its geared motor to its curiously flexible wind blades. Exultation filled Hal Dane as he looked on this thing he had created.

It was an exultation that was short-lived though. When he went out to the exhibition grounds and saw the veritable trap that had been built for him to rise from, his heart went cold.

Through misunderstanding of the wording of Colonel Wiljohn's frantic telegraphic efforts to get all things ready for Hal Dane's

flight demonstration, the Wiljohn workmen had built no platform for the plane to rise from as had been expected. Instead, they had built a sort of tower inclosure out of which the strange new gyroscope was to take its flight.

A white-faced Fuz McGinnis waited for Hal just outside the door of this tower that looked like a death trap. He hadn't seen Fuz for months now since demonstration flying had taken McGinnis into half the states of the Union on Wiljohn business.

The two young fellows gripped hands.

"News of this outlandish tower has spread like wildfire. I heard about it three states away, and came to see for myself. And now that I've seen—" McGinnis thumped a clenched fist against the wooden wall, "I—well, it's impossible! You mustn't undertake a rise out of that thing. It will kill you. Any kind of plane has got to have some leeway—"

"The gyroscope," Hal protested, "it's different, only—"

"Only this, it would batter you to death in those four walls!" Fuz began to lead Hal away.

A huge crowd jammed the exhibition grounds. Word of this new thing, this impossible flight of an airplane up out of the

mouth of a tower, had spread far and wide. Men were in groups over the grounds, discussing, waving arms, arguing loudly. The words "Hal Dane—Wiljohn—gyroscope!" were on every lip.

Hal Dane's brain seethed. He hardly heard Fuz earnestly explaining how the affair could be safely managed—mere change of announcement—rise from ground instead of tower.

Better to make no rise at all, Hal's brain told him dully. After this hurrah of advertised excitement, a ground rise would be a flat fall for any interest whatever in the gyroscope. He was suddenly terribly tired. He'd been all of a million years without sleep, it seemed. He'd made a vast effort to get here—for nothing! Nobody'd be interested in the gyroscope any more. And the Wiljohn Works needed the uplift of that gyroscope success, had banked on it. Mother and Uncle Tel—what was he going to do about them? He'd counted on making them comfortable out of this success. And now success had slipped from his grasp—his plans all gummed up by the foolish mistake of some workmen.

Disappointment and weariness were like some subtle drug, doping him into sleep as he stood here.

They were before the announcer's stand. Stupidly, Hal listened while McGinnis made some sort of explanation to the man holding the megaphone—all about changed plan, rise from ground—

"No! No!" Hal's voice was so loud that he startled himself. "Tell them—just what you'd planned to say!"

He wrenched out of the grasp of the startled Fuz McGinnis, and sped back toward the strange tower hangar. Men had already trundled the limp-bladed rotor machine in through the wide door at the base. Hal slipped in, closed and locked that door.

Fuz was a true friend, he meant well—but Fuz couldn't know what this thing meant to him. To fail at this would mean he could have no heart for that dream flight, his exploring of the ocean airpaths on the wings of the winds. A failure couldn't conquer the ocean! He'd either succeed at this—or die at it.

As Hal Dane leaned against the inner wall of that tower hangar in which the gyroscope plane was prisoned, he could hear the excited voice of the speaker of the day addressing the crowd through the great radio amplifier that carried his message to all the throng gathered there.

"It has been said," the voice of the speaker rang out, "it has been said that the climax of aviation had been reached when man learned to fly as well as birds. For birds most surely had the lead on man, having flown for something like twenty million years, while man has merely tried his wings out during about twenty years.

"Man learned of the birds. He patterned his flying machine after the principles of bird flight. He made the ailerons to shift at wing tip and thus to bank his machine in soaring, just as a bird lifts its wing tip. He patterned his light, very light framework after the bird's hollow bones. So man learned to fly like a bird.

"But now we are going to show you that man has learned to fly better than a bird.

"Think of the lark, she has to have space ten times her size to dart forward in before the lift that soars her aloft.

"Take the great South American condor with wing spread of ten feet. Put him in a twenty-foot pen and you have him a prisoner for life. The condor needs many times more than the twenty-foot space for his forward run before his great pinions will catch the air and lift him up into the skies.

"But man has surpassed the birds. He has

learned to fly, and he has learned to rise without great space.

"Within this restricted tower is man's latest achievement, a gyroscope on a Wiljohn-Dane plane. With no space to dart or glide, this plane will rise straight up."

"Would it, oh, but would it?" Hal Dane's heart beat ice cold against his leather shirt. This same type motor had done its duty down there in the danger of the great Three-River Flood. It had risen from a tiny knoll, risen from a crumbling, flood-washed island. Even though over-burdened with human freight, it had risen almost straight into the air. But Hal Dane had been superman, then. Guided by superpower, he had hurled himself recklessly into the jaws of death to save life. In that time of thrilling awfulness, the great plane had answered to his every touch. Like some superhuman creation it had shot up from crumbling death, water death, swamp death.

But now, circumscribed by four man-made walls, wooden, spiritless things that made no real call to courage or feel of power—now would this great plane rise, respond to his will?

Not to rise straight up would mean death —a crashing, roaring piece of machinery battering against walls.

If only there had been a chance to try this tower out! But there had been no chance for anything, no chance to think, even.

With doom upon him, the young flyer slid into the cockpit of the squat, heavy plane.

Whir of motor, crazy tipping and swaying of the machine—then the thrill of power rushing into Hal Dane's veins. She was rising. She was answering his prayer. She was superbird, four walls could not prison her.

With a rushing whirl of her now stiffening gyroscope wings, the great machine lifted herself swiftly, steadily; rose in that amazing space of four wooden tower walls scarce ten feet distance from her machinery on any side.

Straight up—then away over the great, shouting concourse whirred the plane. Hal Dane, superbirdman, rode high in the skies, he swooped, he darted in an ecstasy of freedom of the air.

Then wheeling, circling till he hung above the tower with its four walls. He held position for a long minute, then under control dropped slowly, down, down, straight into the maw of the tower.

CHAPTER XXI

CALL OF THE WINDS

Like one come back to the present from a far journey into eternity, Hal Dane sat for a space within the gyroscope's cockpit. He hardly heard the tumult that was men battering down the locked door to the tower hangar. Next thing he knew, many hands were lifting him out of the squat machine that had made its triumphal straight-rise, and its equally triumphant down-drop.

Fuz McGinnis, red hair on end, eyes blazing with excitement, was the first to get to him.

"By Jehoshaphat J-J-Jumping—man, you did it!" Fuz howled incoherently, "but I wouldn't live through another t-t-ten minutes like that—not to be President, even!"

Then Mr. Rankin, representative of the great Onheim Prize Fund, was pumping his hand up and down, "Congratulations, Hal Dane! The award is bound to be yours. There's not the slightest doubt that your ex-

traordinary performance has beaten every other safety record set here today. Things'll have to be confirmed at headquarters though —will be letting you know."

Once Hal was outside the hangar, the surging crowd pressed close. He was the center of a shouting, thrilling excitement. Newspaper men fought their way to him. Questions were hurled at him thick and fast.

Could that thing be counted on always to rise straight-up, and to sit back down just like that, behind a wall, or a steeple, or anything? Hal rather thought it could, considering the flood test, and now this shooting up out of a tower.

That being the case, did he realize that this invention was likely to revolutionize the airplane business? Had he caught the vision of what the gyroscope could do in the way of taking off and landing on a mere roof top? Had he any plans for the now very possible city-to-be which would have roof-top terminals on all its down-town buildings?

Heavens, how these reporter fellows could shoot off questions! Hal answered, "Yes, and yes again, and, well no, he hadn't drawn any plans of future cities—he'd been too busy drawing plans of airplanes—" And then Hal ducked for cover.

"Here, Fuz, help me get out of this," he whispered, "there's somewhere else I've got to be, now—right away!"

So Fuz had slid into the cockpit of his own Wiljohn biplane, warmed up the motor, and held the machine in readiness behind the long mechanics' hall near the center of the grounds. Ten minutes later, Hal Dane entered one door of this building, went out by another door, flung a leg over the cockpit, and was in beside Fuz. In the next moment, he was riding high above the throng, fleeing from fame, on the way to the "somewhere else"—and that was the Mazarin Hangars on the city outskirts. Here was housed his own plane, his Wind Bird, that he'd not yet seen in all its completeness.

He felt light of heart, almost giddy with his sense of freedom. Out there on the exhibition grounds by his successful demonstration of the Wiljohn-Dane gyroscope, he had paid his debt to the man that had most befriended him, Colonel Wiljohn.

As they landed out in Mazarin, a man in the Wiljohn uniform, who had been pacing back and forth before one of the low, single-plane hangars, waved to them, then turned about and quickly unlocked the wide, sliding doors.

Hal sped forward in quick, nervous strides,

but paused on the threshold. Now that he was here, he was almost afraid to look. They had completed the ship in his absence. Suppose mistakes had been made, suppose—

His heart seemed thundering up into his very ears, his face was white and strained as he plunged into the semi-darkness of the hangar. The attendant slipped in behind him, switched on wall lights, overhead lights.

"A-ah!" It was a long, exultant, in-drawn breath of ecstasy. Hal Dane stared as though he could never get enough of looking.

The ship—his Wind Bird—she was a beauty! Slender crimson body, silver wing, every inch of her streamlined to split the wind like an arrow!

Slenderly beautiful — but what strength there was here! There was a compactness to this winged creation that only an exact knowledge of certain sciences could give. In the peculiar curved shape of the wing surface lay the solution to one of the deepest hidden secrets of flight. The old flat shape of airplane wings had depended entirely upon air pressure from below for the rise. The peculiar curve to the Wind Bird's silvered wing would take full advantage of a thrice greater power—the air's suction pull from above. The material in the wing was in itself a

marvel, laminated strata, light in the extreme, yet almost as tough as iron.

Engine streamlined, as well as body! To the unpracticed eye, the modernistic Conqueror-Eisel engine might have seemed absurd in its smallness and its simplicity. But Hal Dane knew from long experimentation that in its simplicity lay the fundamental reliability of this new type engine. He spun the motor and sat back on his heels to listen to the smooth gentle hum, music to his mechanic's ear.

Everything was as he had planned it—great fuel tank for the high-powered oil he would burn instead of gasoline, another tank to hold the liquid, life-giving oxygen he would need in the heights. The latest life-saving devices were installed: radio sending and receiving apparatus, flares, rockets, detachable compass, and a rubber lifeboat in addition to those appliances that, in an emergency, could convert the plane wing itself into a sea-going raft.

It was Hal's plan that nothing that could be humanly prepared for should be left to mere chance.

The need for such care had already been driven home to him by the tragic fate of two of his gallant rivals in this great flight. Just

the day before he arrived in San Francisco, young Randall and the veteran, Ed West, in their great trimotor had made their start at winging the Pacific for the Vallant Prize. Either overload, or some fault of mechanism had caused the great plane to fail in a rise above the cliffs. Both pilot and mechanic had crashed to death.

Jammed throttle had set another competitor adrift on the sea edge—where, luckily for him, there were boats a-plenty for the rescue.

With these hazards in mind, Hal kept testing and retesting every part of his equipment and mechanism. He bunked that night in the hangar, and with the morning was again at his work. Terrific coastal rains set in. But snug within the closed cockpit of the Wind Bird, Hal joyously challenged the downpour.

At the first flight test, the silver and crimson ship rode the rain clouds with a thrilling swiftness. For the second flight, loaded with all the weight that an ocean flyer needs must bear, the Wind Bird labored somewhat in the rise, found her speed more slowly. That initial slowness was a thing that had to be borne with. Compensation would come in the continuous quickening of speed as each hour of flight burned up its quota of fuel, and, degree by degree, lifted the weight.

For two days of rain, Hal continued his tests. In between periods of work he flung himself down to sleep like a log, letting nature repair the nerve strain of that long nightmare of flood rescue work.

Sleep was about his only weapon, too, for dodging newspaper men. Reporters were fine, friendly fellows, all right,—but, well, Hal didn't want to talk. What he wanted was action, to be off.

All his life seemed to have been leading up to this one event—his take-off for his viking flight on the winds of the ocean. And here was the take-off held up by rainstorm, an endless one it appeared.

Along the Pacific coast, five other flyers were ready too, awaiting weather conditions for the great journey.

Storm and fog kept Hal Dane on edge for another twelve hours. Then he decided to wait no longer.

Why couldn't one take-off in a rainstorm? No worse than running into rainstorms out over the waters! On such a journey a flyer had to face all kinds of weather anyway.

CHAPTER XXII

WINGING WESTWARD

At midnight Hal Dane made his decision. He snatched a few hours' sleep. Then in the early dawning he went out to inspect the Mazarin Field runway. Not so good—ground wet and heavy with days of drenching rain! But as the downpour seemed scheduled to continue indefinitely, things could only get worse instead of better. So—well, it might as well be now!

In spite of the foreboding, heavy weather, Hal Dane's heart was light. The past days of indecision had sat like a burden upon his soul, and now that his mind was finally and firmly made up, he suddenly went ecstatic, happy beyond all measure.

He caught himself whistling as he gave his plane its last thorough looking over. It seemed to be in perfect shape. Whew! What a beauty it was! He slid an affectionate hand along its polished length as the men trundled it out into

the field. There he slung aboard his provisions and water, climbed in and gave the signal for the blocks to be knocked away.

The motor roared and the plane started down the runway.

"Wish I were going too," yelled the red-headed McGinnis as he raced alongside.

"Wish so—" Hal's words were lost in the thud of the motor. The machine labored forward, gathering speed slowly. Wet, muddy ground and the last load of fuel seemed to have rooted it to earth. Would it never rise? Was this splendid attempt to meet disaster in the very beginning?

At last the heavily-loaded Wind Bird began to lift gallantly, rose to barely clear the tree line, then zoomed up into the sky.

Even at this unearthly hour, a horde of spectators milled on the ground below, their hearts' hopes rising with this brilliant attempt of young Dane. For the young fellow, the shyest of heroes, who had run away from his first taste of fame, had overnight fired the enthusiasm of the whole nation.

As though lifted on the shouts of the onlookers, the lone flyer in his Wind Bird took the air and went up, up into the heights.

He leveled out for a while to get speed, then rose another thousand feet.

Hal Dane had taken off at a little after six o'clock in the morning, and he had headed out with his back directly to the rising sun—or at least with his back to the place where the sun would have been seen rising if the cloud banks had not hidden it.

In a few moments, the skyscrapers of San Francisco, looking white and spectral, were swallowed up in the gray-brown pall that enshrouded the Golden Gate. Hal's last picture of them was of mere tower tops that seemed to hang like a magic city in the clouds. A forerunner this, of the mirages he was to encounter later on, when magic cities would seem to rise before his tired eyes, then crumble away among the clouds.

Below him swept an immensity of ocean, the color of ashes in the misty haze. Nowhere was there any mark to guide him. From now on he must rely entirely upon his instruments, and Hal began to keep a wary eye upon his inductor compass.

That compass was the most remarkable of all the splendid equipment features of the Wind Bird. It was based upon the principle of the relation between the earth's magnetic field and the magnetic field generated in the airplane. When the plane's course had been set so that the needle registered zero on this

compass, any deviation would cause the needle to swing away from zero in the direction of the error. Such an error could be corrected by flying the plane with the needle at the same distance on the other side of zero, and for the same time that the error had been committed. This would set the aircraft's nose back on her course again.

When well out over the ocean, he took calculations and set his course due northwest. He was figuring on covering the ocean in a crescent-shaped sweep that would have the advantage of sighting the Aleutian chain of land points at better than midway, and it was a course that he hoped would send him well within the range of certain air currents.

As his course steadied, the roar of his ninefold engine assumed a pleasing grandeur, like music flung out over these far spaces. The motor was working to perfection, humming along under its mighty load. It was a comfort to know too that every pound of fuel burned meant a lightening of the weight and an added capacity for speed, more speed.

In a flare of fire, the sunlight burst through the gray world of clouds. The rainstorm was lifting. Weather conditions that had frowned so on his take-off were changing to a golden glory to speed him onward. But Hal Dane

knew all too well that this fickle glory of sunshine could change back to black thunderheads in the twinkling of an eye.

To the right of his plane, he caught a glimpse of a faint dark blurred line. That could be the west coast, the land of America that he was speeding away from now in a northwestern diagonal.

Was this blurred glimpse all that he'd ever see of land again? Who could tell? He might land safe on those other shores, and again, a hundred different causes could crash his gallant sky ship into the gray waves, to sink eventually to the ocean bottom.

Hal squared back his shoulders, lifted his head. He would force dark thoughts out of his mind. There must only be room in his plans for hope.

He sent the throttle up a notch. More speed! His heart caught the lift of power from the throbbing motor. Exultation, and the wild spirit of the Vikings surged through his veins. His Norse ancestors had crossed an ocean in a frail sea skiff. And now he, like some atom adrift in the immense wastes of the sky, was daring the air currents on man-made wings. Hal Dane felt a thrill of power and glory shoot through him. It was speed on to whatever the end was, to death, or to victory!

For this longest of long distance flights where every extra pound counted against success, Hal had stripped his plane to the barest necessities of weight in food and equipment. Then at the last minute he had carried things, light as air, yet weighty in a certain kind of content. God-speed telegrams from his mother, from the faculty of his old flying school, from Colonel Wiljohn! There was also a yellow slip of telegraphic paper bearing him congratulations and word that his gyroscope had won the Onheim Prize. The hopes and thoughts of his friends were going with him on this wild venture.

All unknown to him, the thoughts of a nation were following the Wind Bird. A ship that had glimpsed a flyer going up coast had radioed word back. Other messages swept through the air from a far-out fishing fleet where the lone flyer crossed human sea trails again. This word was bulletined in theaters and picture show houses, was on a million lips. Wind Bird had gone thus far. How was the weather? Could he make it?

At midday the lone flyer checked up position and headed out over the Pacific in a more westerly direction. Far to the north of him would be situated Sitka, behind him should lie Vancouver—it was in this air range that

he, on preliminary explorations, had located a great current of the wind that flowed west in the heights.

If he and the Wind Bird could efficiently ride this current it would mean speed such as he had heretofore only dreamed of, would mean time and fuel-saving in the great Trans-Pacific crossing.

In preparation for his chill rise up into the earth's stratosphere, or upper air, Hal Dane snugly closed the throat of his heavily padded, leather-covered suit of down and feathers. Fur-lined moccasins over his boots, and a leather head mask lined with fur, which with the oxygen mask entirely covered the face, completed the costume. His goggles had already been specially prepared with an inside coating of anti-freezing gelatine, supposed to prevent the formation of ice to minus sixty degrees Fahrenheit. Ice on the inside of the goggles would be a temporary blind, as Hal well knew.

Worse than the terrible cold was the lack of oxygen he would have to combat up in the heights of rarefied air. But a marvelous artificial aid had been prepared for this also. In the Wind Bird was installed a special oxygen apparatus that could furnish him a strong flow of life-giving gas through a tube ad-

justed to the mouthpiece of his helmet. With minute care, Hal examined every section of his two separate systems of gaseous oxygen, the main system, and the emergency system. He wanted to be very sure that nothing was left to mere luck. Other men before him had ridden high. But today, he must ride the highest stratosphere if he were to really explore the vast speeding wind river that his other searchings had merely tapped.

Hal Dane began to climb. By degrees he forced the Wind Bird up, the curved vacuum of her specially-built wing meeting the air-pull from above to aid in a mighty lifting.

Up he went in great sweeping spirals, ever mounting higher and higher, the engine of the Wind Bird working beautifully. The altimeter told him he was at the height of seventeen thousand feet,—now he had reached eighteen, nineteen, twenty thousand! His ship was still climbing, acting beautifully. But he, Hal Dane, was not acting right. In the face of triumph, his whole sky world went suddenly gray and dreary, he felt a queer lassitude, and a slowing up of faculties.

The oxygen! In the excitement, he had forgotten to draw on it!

With a languid movement, he thrust the tube into his mask. A few deep breaths and

his gray world brightened. More oxygen, more,—and he had changed back into his old self, ready to think and act quickly.

Now he was entering into a favorable wind that sped him in the rise. He went to thirty thousand feet.

Thirty-four thousand! Thirty-five! Thirty-six!

The cold was now intense. For all his furred garments, there was no shutting out the frigidity. It ate to the very marrow. But Hal Dane's heart was hot within him, burning in its thrill of exultation. He was riding thirty-eight thousand feet above the earth, and riding with the whizzing speed of a bullet shot from a mighty gun. His plane, capable of two hundred miles an hour, had slid into a two-hundred-mile wind here in the upper air, and it was hurtling forward at the appalling speed of four hundred miles per hour.

Speed—speed! Hal Dane's heart throbbed hot and wild. He was riding faster than ever mortal rode before, swooping before the mad currents of the river of the wind. The crossing of the great Pacific will now be a matter of hours—not a matter of days. And his the Viking sky boat that first dared the fierce gale of the wind path!

The gale he was riding gathered power. His

speedometer mounted erratically, jerking up records of additional fives and tens of miles. Ten—twenty, thirty—four hundred and forty miles per hour.

A curious vibration of his engine startled him. But he drove away all thoughts of danger. The mileage was a magnet that held his eyes. Speed, speed! Riding high and fast! The sky was his height limit. He was reeling off a record. He must hold to it, must speed on.

Riding higher and faster than any human since creation! Thrilling thought—thrilling thought—thrilling thought—his head was knocking queerly. He leaned forward, and the instruments in the cockpit became dim and shaky. He was drifting into a semi-delirium from which he could not seem to rouse himself. His mind refused to focus upon what it must do.

His dulling senses caught a thud-thud-thud! Engine vibration so great that it seemed the machine must tear apart!

CHAPTER XXIII

FIGHTING DEATH

Even the exertion of leaning forward, slight as it was, proved dangerous in the abnormal condition the high air produced in the human system. In that instant of stooping forward, Hal Dane lost consciousness and fell with his plane, like a plummet, through the thin air.

The rarefied state of stratosphere was as dangerously violent against the human-made air machine as it was to the human body. Despite oil emulsions on the wings, up here in this terrible cold, ice formed with deadly quickness on every part of the machine. In an instant, the plane was covered all over in a frozen layer an inch thick. Ice formed continually on the propeller, and was as quickly thrown off in terrible vibrations that near tore the motor mechanisms asunder.

And young Dane, a modern Viking who had dared ride the uncharted skyways, hung

limp across his belt strap. The insidious treachery of the upper air had taken him unawares and hurled him into unconsciousness in the midst of his triumph of speed.

The life-giving oxygen was there in its tube, at his very lips, but here in this dangerous light-air pressure, Hal had not been able to assimilate all the oxygen that he needed. The human lungs, built to take in the amount of air needed at ground levels, had balked at having to take in five times the usual volume as was necessary in the heights of the stratosphere. And all in an instant, the exhaustion of air-starvation had claimed the flyer as its victim.

Down and down shot the plane, wallowing in the air troughs like some dismasted ship in a sea wreck.

And now, choking, hanging limp and unconscious though he was, Hal Dane began to faintly breathe in the blessed heavier air of the lower altitudes he was hurtling into.

Back from the heights he slid, back into normal air pressures. He shot ten thousand feet while the struggle for breath and for consciousness held him. Longer and deeper breaths he drew at the tube, and the oxygen gradually began to restore his strength.

As control of self came to him, he straight-

ened back into position and fought to bring his mad ship to an even keel.

Below him lashed the hungry, growling wastes of the Pacific. As he plunged wildly downward it seemed that the ocean depths would swallow up the twisting, turning plane before it could gain its equilibrium.

On he came, diving, stalling, slipping—flattening out at last in a long lightning quick swoop above the waves.

With nerves in a forced steadiness and hands like steel gripped to their task, Hal had checked the meteoric fall and had regained some measure of control over his craft. Now when he dared relax, he found himself, within his furred clothing, dripping wet in a horror sweat. In a brief ten minutes of life he seemed to have tasted every extreme, heat, cold, rising, speeding, falling.

In his fighting back to level out, he had dipped out of his course—his earth inductor compass told him just how far a dip he had made, and he traveled in a swing to the other side until the needle was again at zero.

Riding the normal airpath above the ocean at an average clip of round about a hundred and fifty miles the hour seemed safe and slow after that life-and-death race high up in that stratosphere layer above the earth.

As the afternoon wore on, Hal twice again mounted high into thin air and rode the winds for a brief space, each time coming down before exhaustion could quite claim him. Risky as these performances were, they were undertaken in no mere daredeviltry of spirit. Instead, it was for experiment's sake that Hal Dane repeatedly dared the weird dangers of the stratosphere's violence of wind and cold. He wanted to prove to himself that his new-found, splendidly dangerous river of the wind flowed always into the west. For already he was dreaming of a plane built to more efficiently take advantage of this great aerial current.

For all its careful designing, his present Wind Bird could not steadily ride this high, cold aerial river. There were certain necessary points of construction that needs must be considered in flying craft for the high, thin air strata. Hal Dane's heart leaped to the thrill of what he was learning. Those great aerial currents had half battered the life out of his body, but from his terrible contact with them, he had wrested secrets to carry back to the builders of airplanes.

As Hal Dane skimmed the ocean surface at a steady, rhythmic gait, his mind leaped ahead to future aircraft building that should utilize

the knowledge that he had gained by his stratosphere explorations. He had found that the human body, fashioned to thrive in an air pressure of something over fourteen pounds per square inch, could suffer intensely when lifted to a rarefied air pressure of merely two and a half pounds to the inch. But since man had been smart enough to lift himself on wings above the clouds, why, now man must be smart enough to lift his normal air pressure with him. This could be done, Hal believed, by making the plane's cabin of metal, hermetically sealed, and equipped with oxygen tanks to maintain the same air pressure as at ordinary altitudes.

From long practice, Hal's hands mechanically shifted gear in the speeding plane, to hold to an even flight, while his mind wrestled continually with the many problems that even his brief taste of stratosphere flying had opened up to him. On future "high flyers", the sealed cabin would necessitate the working out of some method of absorbing the gases given out by the breath. Then, too, the ordinary systems of controls could not be used, as they would necessitate holes in the "sealed cabin." Ah, he had it!—electric controls could be devised to govern rudder, elevators, ailerons. This great power could be used to fight

the terrible high air cold, also, and electrical heating would keep the deathly dangerous ice sheath from coating wings and—

With a startled gasp, Hal Dane swung from dream planning back into reality, in bare time to hurl his ship upward out of a strange danger. Beneath him, the ocean surface rolled into a monstrous heaving, and a waterspout shot upward, barely missing his wing.

CHAPTER XXIV

NIGHT

At his swift touch, the plane reared upward and away from the danger that was rolling and heaving directly beneath. Peering out of the window at his left, Hal saw in the waters a procession of monsters. In the dusky haze of the twilight, a great school of whales were disporting themselves in hugely fantastic leaps and lunges. When a sixty-foot whale would leap high in the air, then drop its tons of weight back down against the waters, it seemed that creation shook to the concussion. At the thunder of huge bodies smashing back through the waves in their enormous fantasies of playfulness, Hal sent his ship rising higher into the air. If one of those monster bodies even brushed his wing or rudder, it would mean his plane crushed into helplessness, himself adrift upon the ocean.

With the approach of darkness, Hal Dane's

spirit seemed to reach its zero hour of loneliness and weariness. Since the dawn of day he had matched his strength in battle after battle with the varying phases of the elements. He and his frail wind craft, mere contraption of cloth and wood and some lengths of steel tubing, had come out victorious so far—but there was still the night ahead of him.

He realized with a start that he had not tasted food for more than twelve hours. Even now, he felt no hunger; the long strain of matching human wits and power against the winds had taken away his appetite. However, he required himself to eat a sandwich and drink some hot coffee from his bottle. This would help him keep up his strength. He needed that help for strength. The darkness he was entering was a worse monster than those vast thrashing whale bodies he had just escaped.

Loneliness entered the lists against him also. As far as he could see over all the great ocean stretches, there showed no tiny pin point of light that could be a great trans-oceanic steamer cruising onward with its vast burden of human lives. If anything happened to him out here in the night, he was all alone, no vessel near to come to his assistance, no help outside of himself. If he died, he died

alone—a mere atom dropped down in the ocean depths.

With an effort, Hal forced his mind away from morbid thoughts. He concentrated on his maps and instruments. Already, he had come over two thousand miles. With every whir of his motor he was ticking off more miles. A great longing rose in him to ride the high air currents once again, that would mean real speed. But he dared not risk his plane another time in the icy grip of the stratosphere. He had wracked the engine enough already. Another such battle with the ice sheath and with over-speed might tear the motor bodily from the machine.

To add to the loneliness of the night, he now swept into a stratum of fog. It hung in an enveloping mass about the ship, creeping into the cockpit, clouding the instruments. As Hal rode high to avoid the fog, he swept into an area of black clouds, snow clouds. At this altitude, he found the air filled with hail. In a moment these heavy, dangerous ice pellets were rattling angrily against the plane. Like a hunted creature, Hal shot this way and that striving to dodge the zone of ice and sleet. It was no use; the ice pall pursued him, sheeted his ship. Wing surfaces were flung out of balance with additional weight, controls be-

gan to clog. There was nothing to do for it save drop back down into the warm, foggy layers of air just above the waves. As soon as he hit the warm zone, ice began to melt, its heavy, retarding weight slid off. The speed of the ship, which had lagged below eighty miles the hour, now began to zoom back up well over the hundred mark.

His instruments would hold him to his course, and the noctovistor installed on his plane would catch the red glow of any ship's light, even through the fog, and warn him of its presence. But unlighted derelict ships adrift on the sea, and floating ice peaks were dangers that the red eye of the noctovistor could not record. His luck, alone, could carry him past such of these that happened in his path.

Later in the night, a glow on his noctovistor told him that a ship lay ahead. Hal sped sufficiently out of his course to avoid any danger of collision. Out through the air, though, he began flinging radio messages, and soon picked up a reply. From this ocean liner he got confirmation of his exact location, and the time. Brief enough messages they were, but Hal Dane blessed the wonderful science whose marvels had put him in touch with other humans out here in the lonely stretches of the

great ocean. He zoomed on into the night with his heart cheered by this brief contact.

He now winged his way out of fog and cloud into the white light of the late rising moon. Now and then in this silver glow, mirages swam into his view. Peaks, foothills, ravines and rivers were etched so boldly in the sky that they seemed almost real. Fantastic hills and valleys would crumble away, and others equally fantastic would rise to take their place.

Then dawn began to break. Streaks of light crept up behind him out of the western sky. Below him, land appeared, islands dotting the ocean in a long crescent dipping northwest. Land—was it real, or merely another mirage? He flew lower. It was, yes, it must be real. There were houses, men like tiny dots, and a fleet of fishing craft that seemed mere toys, was setting out to sea.

It was the far-flung land chain of the Aleutian Islands that he was crossing. With a queer thrill in his heart, Hal Dane looked down over the side of his ship. Below him was real earth. He could land here if he wanted to, be in the midst of people. Right here he could end the long loneliness—if he wanted to.

Resolutely, Hal kept his plane headed for-

ward. According to his charts he must turn slightly to the south now for the last southwestern curve on his crescent-shaped route.

The longest stretch of ocean flight was over now; he felt that he had conquered the worst. In less than twenty-four hours he had come over three thousand miles—nearly three thousand, five hundred, in fact. At this rate he ought to sight the island kingdom of Japan in the afternoon of this day.

But in his reckoning, Hal had not taken into account the treacherous weather of the northern reaches of the Pacific. Instead of making good speed on this last lap of his journey, he began to lose time, to drop behind on his carefully worked out schedule.

From now on, he swept along in a continuous storm area. Gales seemed to roar up from nowhere and burst about the plane. From his student weather studies, that now seemed part of a long-gone past, Hal Dane had learned much about the thunderheads and twisters of the atmosphere. He knew a deal about gauging the breadth and diameter of certain type storms, their speed of movement, the velocity of the winds within these storms. Every shred of such knowledge that he had was put to severe test now. In his plane, he was like some hunted wild animal fleeing be-

fore the storm hounds, turning, twisting, riding now high, now low. Time and again he was only able to avoid a crash by feeling his way around the edges of the storms and dodging between them, never letting his plane become completely swallowed up in the maw of the storm monster. Sometimes two or three storms came together. A low-powered airplane would have been lost for lack of force to make headway in such a case, but the mighty Wind Bird courageously battled forward on these constantly changing air currents.

Then the clouds shredded away, and the glow of the evening sun lit the sky.

Hal Dane relaxed in his seat. He had fought a long fight, had lost all reckoning of time, space, of ocean distances. He had flown far enough to be near land—of that he was sure.

Soon he had confirmation of his hopes. His plane swooped into the midst of a flock of sea gulls. These winged fishers of the air often flew hundreds of miles from shore—but the sight of them usually meant that shore was somewhere in the distance.

Right enough Hal was in his deductions. Soon after he had passed through the gull fleet, he glimpsed tiny dots dipping on the

waves below him. He flew lower. It was as he had hoped, these dots were men out in their fishing boats. Soon a shore line came into view.

When the Viking of the Sky swooped low over this land, however, the thrill in his heart changed to dire foreboding. He had come far enough to land in Japan—but this was not Japan, land of the flowery kingdom. Those squat fishermen below wore primitive, furred garments. Instead of pagodas and quaint paper-walled dwellings of the Japanese, here crouched a squalid village of round-roofed mud huts.

Storms had sent him far out of his course. Instead of Japan, this was Kamchatka that he floated above. Away to the south of him lay the Tokio of his destination.

In the face of a terrible weariness that was creeping over him, Hal Dane turned the nose of his craft to the south. He had already spent one night out over the ocean, and now another night was darkening his sky.

CHAPTER XXV

HIS NAME ACROSS THE SKY

Deep in the night, and in a dense fog, Hal Dane hovered over a faint earthly glow that he felt must be Tokio, capital city of Japan. Hours ago he had straightened the wide deflection of his course that had taken him astray over the edge of the long peninsula of Kamchatka.

As he checked up again by chart and map, his wearying senses told him this must be it—the Tokio that he had crossed thousands upon thousands of miles of ocean to reach.

He drifted down to four thousand feet altitude. From here flood lights and beacons were dimly visible, more assurance that he must be over the imperial city of the Orient's most progressive civilization.

A thrill shot through Hal Dane, lifting the great weariness of the forty hours' continuous flying. Aches and chill and battering of storms were forgotten now that the fight was

ending. He had done what he had set out to do—crossed the greatest of the oceans in a single non-stop flight.

His fingers began to tap an incessant query on his sending-radio outfit, "Landing field? Landing field? Landing field?"

And suddenly he was in touch with answers winging their way up to him from the ground below—"Tokio Asahi! Tokio Asahi!" Over and over he got those two words—"Tokio Asahi!"

He was in touch with humanity again! Men on this Japanese land knew he was winging his way above them. Men were answering his call. "Tokio Asahi"—there it came again. What did it mean?

His radio was bringing him words, but they meant nothing to him. His only comfort lay in the fact that men knew he was here in the air, and that probably they were making some preparation for his landing.

It seemed to him that now a glimmer of flares burned brighter in a certain spot. He hoped these marked a landing field, hoped also that radio landing beacons would be here to respond to the visual radio receiver on his instrument board.

Down he came in long sweeping circles, seeking a place to land. A wrong landing

could mean death, not only to him, but to hapless ones he might crash upon down there on the fog-blanketed earth. For dreadful sickening seconds, apprehension rode him. His heart seemed clutched in iron fingers, his face was white under the strain as his eyes watched the instrument board.

Ah! they were quivering — those two strange little reeds that by their vibration told the good news of radio beacons waiting down there to help him make his landing. With a joyous surge of relief in his heart, Hal Dane began his long, slanting, final downward plunge. An over-quivering of the left reed told him that he was diverging too much on that side. With a quick swerve of the airplane, he put both reeds back into a balancing quiver, and thus followed their direction straight down the path of the beacon to a landing.

He had landed! He was in Japan!

The young flyer had been so engrossed in blind flying to a perfect landing by instruments alone, that it came as a shock to him to look out of his machine's window and see the huge crowd that awaited him on this Oriental landing field. The throng had scattered somewhat to make room for the ship's downward plunge.

Hal Dane thrust a blond head out of the window. "I'm Hal Dane," he said simply, "in the Wind Bird. We—we made it, I reckon."

At that, the crowd swept in. They had no more idea of what he was saying than he had had of their "Tokio Asahi" that had been radioed up to him. But the boy's smile and his quietness of manner had won them.

Radios had been busy for two days in Japan, as well as in other parts of the world. From the time Hal Dane had left America, radio had winged its messages back and forth to various parts of the civilized universe.

The phenomenal courage of a boy alone flying the greatest ocean, had stirred the heart of Japan. And now that Hal Dane, Viking of the Sky, had made his landing, Japan set him high on her throng's shoulders.

It was a shouting, laughing, good-natured crowd, gay with the colors of Japanese girls' sashed kimonos mingling with the black of more sedate native costumes, and with the trim modern uniforms of Japan's host of young army flyers.

In the first wild rush, the plucky American aviator was fairly mobbed. The shouting, howling throng, wild with joy and excitement, hauled him clear of his plane. Everyone wanted to shake his hand, American fashion,

or even just touch the garments of this one that had flown the skies. Trim, sturdy members of the imperial air force, got to him, lifted him upon their khaki shoulders. Thus he was borne through the streets of old, old Tokio where the automobile and the jinrikisha mingled as unconcernedly as did the old-time temples and tea shops mingle with eight-story skyscrapers and picture theaters.

Behind him, edging the landing field, rose a fine modern building. Hal Dane waved an inquiring hand at it.

"Tokio Asahi!" came the surprising answer that was shouted from many throats.

Hal nodded his head as if he understood, but puzzlement seethed in his brain. What did this queer shout mean that greeted him everywhere, even met him in the air before landing?

As the triumphal procession made its way down the street, newsboys, carrying bundles of papers, tore through the swarming crowds, ringing bells, flying small flags, and shouting loudly as they waved these "extras" just off the press.

Their shout floated back to Hal with an irritatingly familiar refrain, "Tokio Asahi! Tokio Asahi!"

And suddenly, from his perch on men's

shoulders, that lifted him hero-wise above the crowd—Hal Dane burst into boyish laughter. He had it, that "Tokio Asahi,"—it was the name of Japan's greatest newspaper—the newspaper with over a million circulation, and with a most modern of modern air mail deliveries. That was evidently the Asahi's own great landing field he had arrived above, so naturally it was the name Asahi that had been radioed up to him.

Well, the Asahi was certainly an up and coming publication. As young Dane peered down from his place at the second army of newsboys speeding with flag and bell advertisement through the mob, he saw with astonishment that his own picture already smudgily adorned these latest extras. And men and women, gone wild over this young conqueror of the skies, were scrambling for these pictures.

At last the efficient Tokio police rescued Hal Dane from the rough-and-tumble admiration of the street crowds. Somehow they got him free and rushed him into a building. And here Hal found himself shaking hands with Charles MacVeagh, American Ambassador to Japan. Here he met Baron Giichi Tanaka, Premier of Japan; Suzuki, the Home Minister; Mitsuchi, head of Finance Department,

and other notable figures of the Japanese capital,—statesmen whose names were known all over the world.

Although he was now in a daze of weariness, young Dane forced himself to answer quietly and simply their many questions. To hold the fascinated interest of such great men was an overwhelming honor. But something besides honor was overwhelming the gallant aviator. Sleep, sleep—how he ached for it!

Then next thing, he was stretching out his weary bones in the deep comfort of a bed and getting his first real rest in two days and the better part of two nights.

When he at last awoke, he found that in all reality he had written his name across the sky! Newspapers in all the cities of the world were giving pages of space to his marvelous flight. Telegrams of congratulation swamped him in ten thousand yellow flutters of good wishes. Crowds surrounded the walls of the American Embassy begging the "honorable one" but to show himself. Tokio outdid herself to pay him honor.

"All Japan breathes a welcome to the great flyer of the skies" were the headlines of a newspaper. And all Japan extended him uncounted courtesies. There was an endless round of processions and receptions in his

honor. He was introduced to the romance of the symbolic "No" dance, the dainty tea ceremony, the elaborate Kabuki Drama, fruit of thirty centuries of culture and tradition. He must see the royal wrestlers, and the strange sword-dance of old Japan.

On a fete day, he had the tremendous honor of riding the streets of Tokio in a great, closed, red Rolls-Royce, seated beside His Highness Hirohito, Emperor of Japan. And seeing the rider of the skypath seated with their own beloved Son of the Sun, all that Japanese throng kneeled. Long after the crimson limousine had passed, the crowd still held its awed position.

For a week, Hal Dane "saw" Japan from sacred Fuiji's mountain crest to the beautiful, sinister hot lakes of Kannawa.

Then America refused to wait longer for her idol to return. Again the hordes of telegrams began pouring in.

There was one from Hal Dane's mother, that simply said, "We knew you could do it—come back to us now."

Vallant, the millionaire giver of aviation prizes, cabled, "You have won it. Your thirty-five thousand is waiting for you."

From the President of the United States came a radio message, "Your victory is all

victory—a peaceful victory. You have bound nations together with a bond of friendship."

And still they flooded in—telegrams, cablegrams, radiograms. From the first, America had gone wild with joy and pride over the matchless flight. And now with the passing days, America grew frantic, would be no longer denied. "Come back—You belong to us—America awaits you!" was the thousandfold message from his homeland.

Under this urge, Hal Dane left sightseeing in Japan to be completed on some other visit and saw to it that his beloved Wind Bird was carefully crated for shipment. Then the young Viking of the Sky boarded a great steamer for another crossing of the Pacific—this time for a journey straight into the hearts of his own people.